THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

ONE "SLUGGER" .. does a "whale of a job"

SPEEDY REDUCTION at LOW COST . . .

The above open view clearly shows some of the outstanding "Slugger" features. Notice the heavy-duty manganese steel hammers, 1" thick liners and breaker plates, the powerful drive shaft, the dust-tight waterproof housings on two heavy-duty, self-aligning roller bearings. These and other features are reasons why you can rely on the "Slugger" to reduce more tonnages at low operating costs.

ONE Williams "Slugger" does such a thorough job that it eliminates the need for other primary or secondary crushers. It will reduce stone weighing up to 75 and 100 pounds to 1¼", ¾", or agricultural limestone *in one operation.*

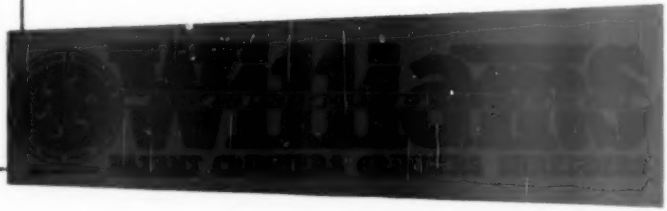
"Sluggers" are built of the strongest materials and *by themselves* do a whale of a reduction job, whether the product desired is specification agstone or cubical-shaped aggregates free from slivers or elongated particles.

The "Slugger" Crusher and Pulverizer gives you not only speed, but also 100% efficiency and economy. Every producer, whether large or small, can profitably install a Williams Crusher. Write for information today.

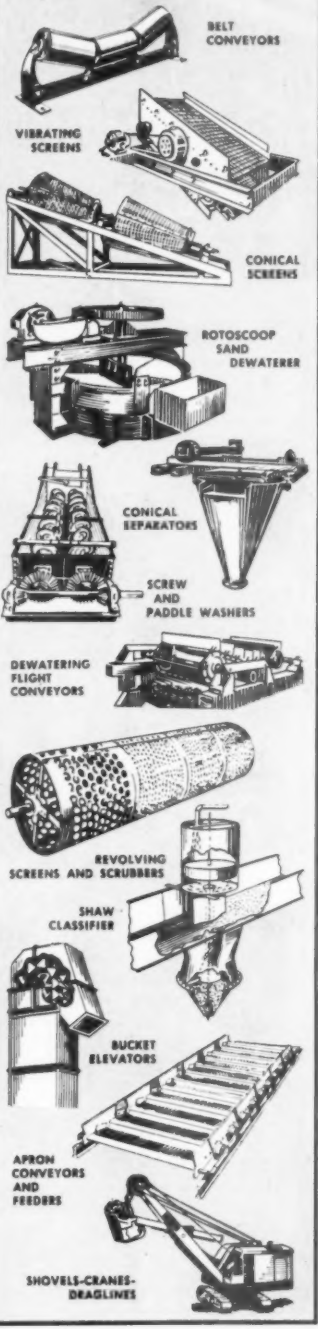
THE WILLIAMS PATENT CRUSHER & PULVERIZER COMPANY
800 ST. LOUIS AVE. ST. LOUIS 6, MO.

WILLIAMS FINE GRINDING EQUIPMENT WITH AIR SEPARATION

Write today for our Bulletin No. 621 on how to get faster, more efficient fine grinding of limestone, lime, coal, talc, etc. There is a Williams Roller Mill with Air Separator to fit your requirements. Finenesses from 100 to 400 mesh. We also build Impact Mills with Air Separation; Mechanical Air Separators for classifying finely ground material or taking the fines out of dry material.



LINK-BELT CONVEYORS AND PREPARATION EQUIPMENT



LINK-BELT *Mechanical Handling Speeds Production* at Bethayres Concrete Products Plant

The concrete masonry industry is another example showing how Link-Belt integrated handling systems produce almost amazing results in the way of high sustained production, better quality and low maintenance—all of which contribute to profits.

At the Bethayres Concrete Products Company plant, some 2500 carloads of anthracite clinker and 100,000 bls. of cement are handled yearly by Link-Belt equipment. Clinker is dumped through grates to an inclined belt conveyor that feeds a single deck vibrating screen from which the oversize is delivered to a two-roll crusher. The pass material and the crusher product discharge to a horizontal belt conveyor delivering to an inclined belt conveyor, to a "CA" concentric action vibrating screen. A system of reclaim hoppers with reciprocating plate feeders permits blending of aggregate from various portions of storage pile. A bucket elevator and "CA" screen serve the storage bin, from which aggregate is taken by a traveling batcher for the block machines. Cement is handled by screw conveyor and bucket elevator.

Whatever your mechanical handling problem, we have the experience and equipment to give you the money-saving answer to it.

Modern Philadelphia home built with Bethayres concrete blocks.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in Principal Cities.

11,101

LINK-BELT

Conveying & Preparation Machinery

ROCK PRODUCTS

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Bror Nordberg
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Nathan C. Rockwood
Editorial Consultant

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IN the cord plies of a B.F.Goodrich belt each cord is completely surrounded by rubber — no cross threads tie them together. These parallel cords are completely insulated from one another by rubber, free to "give" lengthwise and crosswise when an impact occurs. Thus the rubber can distort temporarily to distribute and absorb shocks that would damage a stiff, unyielding carcass. This augmented impact cushion means better belt service, longer belt life.

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This is more true in mining and quarrying than in any other industry. The heart of the job is in the pit. It is the *Key Spot*, the key to production itself. You can't afford to have anything but the best in the heart of the job.

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The Northwest Dual Independent Crowd, that utilizes force other shovels waste—the "Feather-Touch" Clutch Control—the Cushion Clutch—Northwest Uniform Pressure Swing Clutches—Northwest steering—Northwest simplicity of design and other Northwest features are a combination that make one out of every three Northwest Machines sold a repeat order. It is a combination that you should look into. Plan to have a Northwest in your *Key Spots* for greater output. There is profit in "Following the Crowd."

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MAKE YOUR KEY MACHINE A REAL ROCK SHOVEL for the heart of the job!

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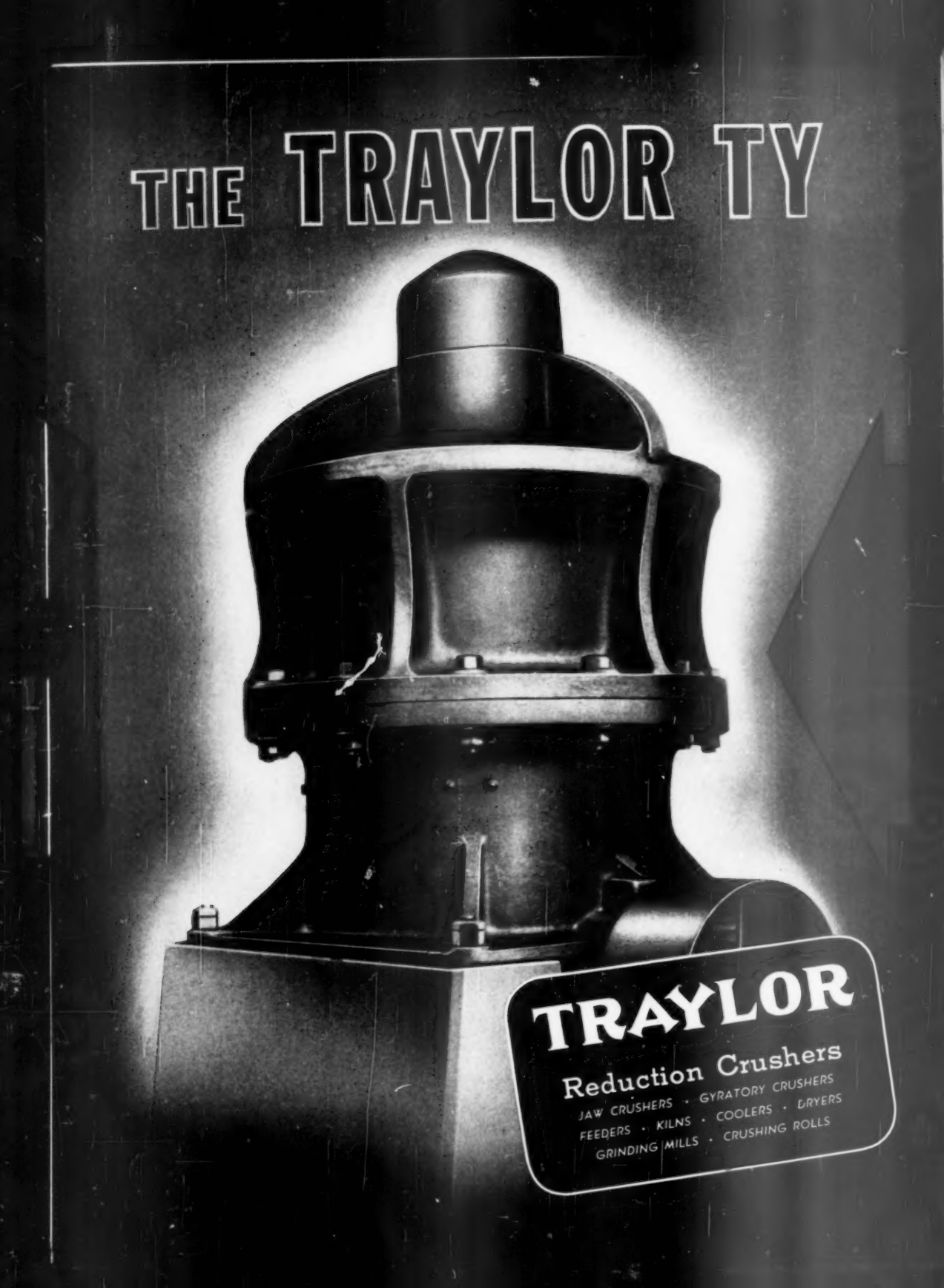
"Convertible for any Mining, Material Handling or Excavating Problem"

THE TRAYLOR TY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GRINDING MILLS · CRUSHING ROLLS

...a Secondary Crusher
OF PRIMARY IMPORTANCE

Proven by an Enviable Record of Profitable Operation

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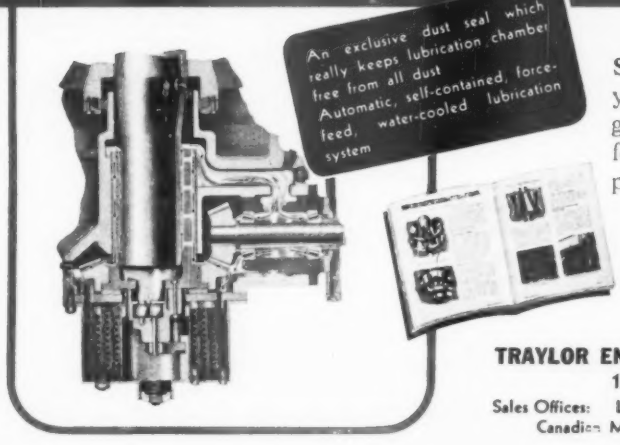
Cast steel frame with three arm spider cast integral
All-around bottom discharge
Non-chokable bell head and curved concaves of manganese steel


An exclusive dust seal which really keeps lubrication chamber free from all dust
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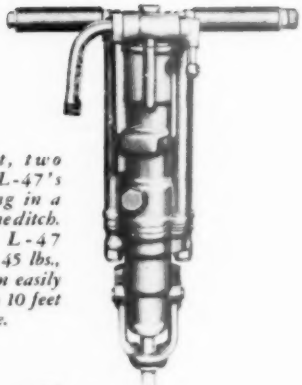
A "Traylor" Leads to Greater Profits

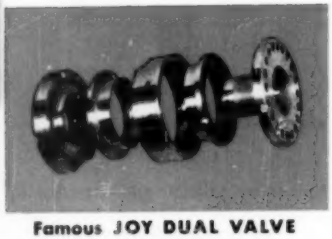


Left, two JOY L-47's working in a pipe-line ditch. The L-47 weighs 45 lbs., and can easily drill to 10 feet or more.

Above, the 55-lb. JOY L-57, for heavy-duty drilling to 15 ft. or more.

Left, the JOY L-37, a hard-hitting 35-lb. drill for depths to 8 ft.

Faster, harder *PUNCH* gives you more footage!



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SAVE TIME
with JOY THRO-WAY BITS

W&D C2065

JOY SILVER STREAK
CADMIUM-PLATED DRILLS

The *exclusive* features of JOY "Silver Streak" Drills—cadmium plating and the famous "Dual Valve"—mean just this to you: faster drilling and less cost per foot of hole—smoother operation, easier on the drill-runner—longer service life and less maintenance. ● Prove these advantages for yourself—write for bulletins, and let us arrange a demonstration for you *on the job!*

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HARD ROCK LUG for severest off-the-road service

ROAD LUG for service OFF and ON the road

Super-tough
for pit and quarry service

IT takes something special to do a super job, and that's why Goodyear designed these two special work-horse tires. They're practically custom-built to meet the various needs of pit and quarry hauling. The Hard Rock Lug is the tire for off-the-road duty. The Road Lug the choice for both *on* and *off* the road.

Buy the tires that are *right* for your hauling needs — Goodyear job-proven tires — they provide the *right* answer to long-life operation at lowest-cost per-ton-mile in mine and quarry hauling.

Both the Hard Rock Lug and Road Lug are built with super-strong rayon cord and extra-heavy treads. Each rolls on a tread specially designed for its own type of work. Ask your Goodyear dealer now to recommend the tire that's best for your operation.

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Road Lug—T.M. The Goodyear Tire & Rubber Company

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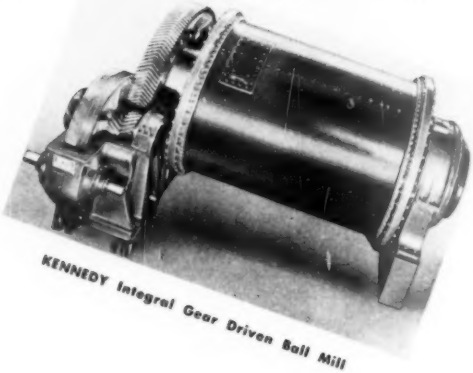
CONVEYORS SCREENS FEEDERS



KENNEDY Integral Gear Driven Ball Mill

CRUSHERS KILNS CONVEYORS

KENNEDY Type "S" Roller Bearing Gearless Gyratory Crusher, Low Head type for fine crushing

FEEDERS PNEUMATIC TRANSPORT SYSTEMS COOLERS

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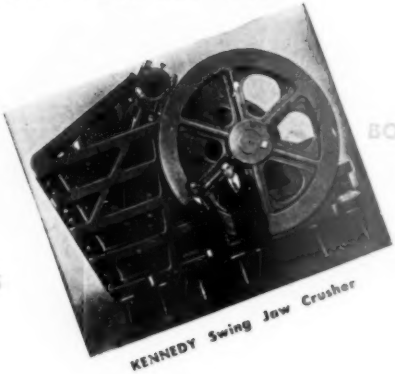
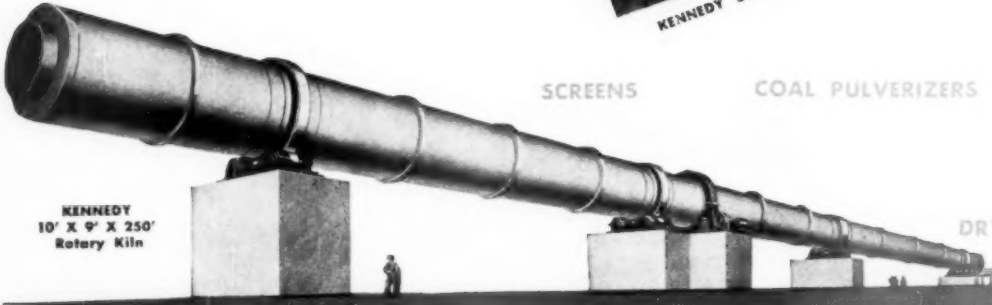


KENNEDY Swing Jaw Crusher

WASHERS BOILERS ELEVATORS CONVEYORS

SCREENS COAL PULVERIZERS



KENNEDY
10' X 9' X 250'
Rotary Kiln

DRYERS

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

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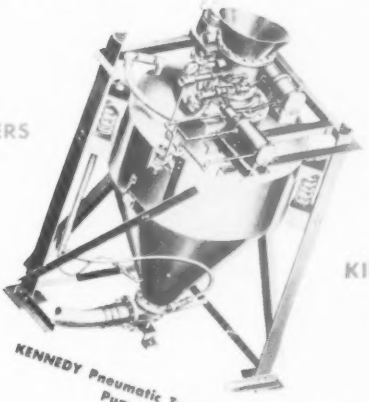
KENNEDY Roller Bearing Gear-less Gyratory Short Shaft Standard Crusher

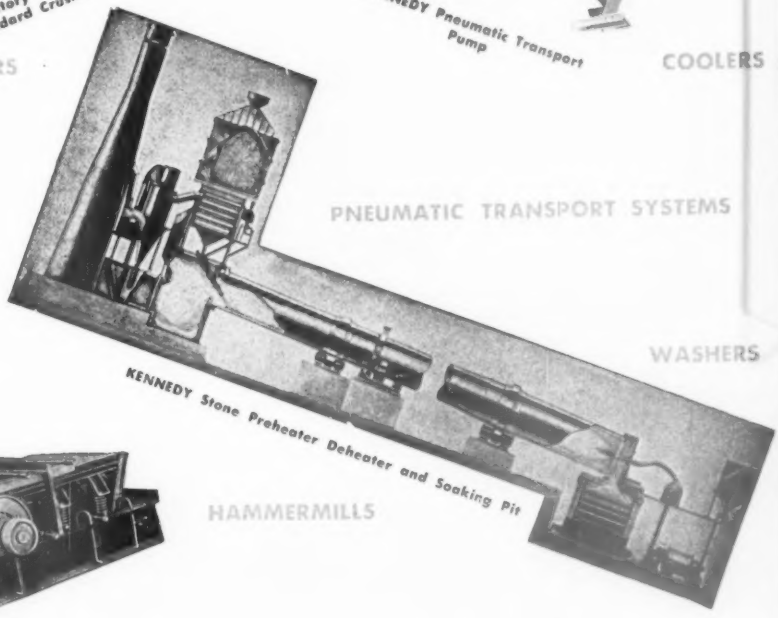
CRUSHERS COOLERS DRYERS



KENNEDY Pneumatic Transport Pump

WASHERS HAMMERMILLS KILNS

ELEVATORS CLASSIFIERS COOLERS



KENNEDY Stone Preheater Deheater and Soaking Pit

COAL PULVERIZERS PNEUMATIC TRANSPORT SYSTEMS

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KENNEDY Vibrating Screen

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78 BRAKE HP. — 19,042 LBS.

2-Cycle GM Diesel Engine

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Handles every type of grading on road or street construction—builds ditches, cuts backslopes, removes sod, shapes up and finishes surface . . . scarifies, mixes blacktop, plows snow.

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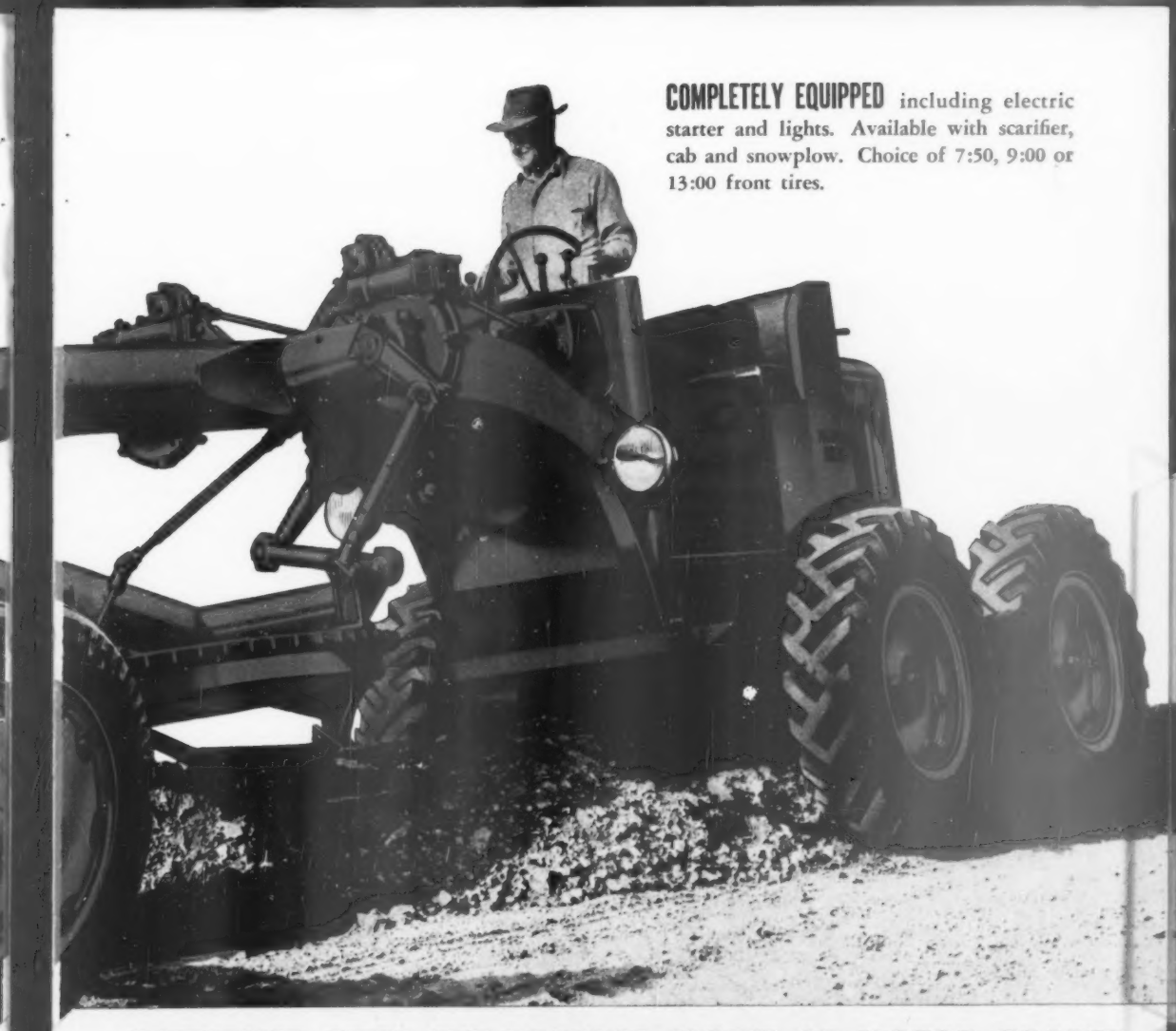
- Six Forward Speeds — 2.21 to 15.58 m.p.h. . . . Three Reverse — 2.64 to 5.74 m.p.h.
- Travel speeds smoothly synchronized with operator controls . . . all the needed power applied as required.
- Easier to steer and maneuver on every type of job — shorter turning radius makes it ideal for narrow roads and streets.

***OTHER ALLIS-CHALMERS DIESEL-POWERED MOTOR GRADERS**

AD-4, 104 Brake hp. . . . 22,140 lbs. AD-3, 78 Brake hp. . . . . 21,835 lbs.
BD-2, 50.5 Brake hp. . . . 17,772 lbs.



COMPLETELY EQUIPPED including electric starter and lights. Available with scarifier, cab and snowplow. Choice of 7:50, 9:00 or 13:00 front tires.

PATTERNED AFTER THE POPULAR MODEL AD MOTOR GRADER

STRONG — exclusive tubular frame . . . absorbs shocks, protects control rods inside frame.

ACCURATE — cuts smoothly, blade held firmly on road through direct down pressure.

HIGH CLEARANCE — 28" throat clearance for handling bigger windrows without interference.

"ROLL-AWAY" MOLDBOARD — less power required to handle bigger windrows at faster speeds. Material is rolled, not pushed.

FULL CIRCLE REVOLVING BLADE — swings 360° . . . enables operator to grade either forward or reverse.

FULL RANGE OF BLADE POSITIONS . . . plus leaning front wheels, for handling all types of grading with ease.

ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

BIG AND FAST

605

KOEHRING HEAVY DUTY 1½ YD.

Fast Crowd . . .

With the Koehring heavy-duty 605, your operator can crowd at full speed up through the bank. Heavy coil spring on each side of slide boom foot absorbs jars and shocks of fast rock handling. Big 30" crowd clutch requires only 7 lbs. average lever pull, yet the operator always retains the "feel" of load.

Fast Retract . . .

Powerful 26" double-band retract clutch gives fast retract speed with perfect control. Double fulcrum units in control-lever linkage eliminate troublesome over-travel of crowd and retract, as well as swing and traction clutches. Speeds up every shovel cycle, cuts operator fatigue . . . and boosts yardage every hour.

Fast Swing . . .

You can use full throttle on the swing, keep swinging fast all day. Big 605 is fast . . . smooth-swinging, because light spiders of inside-band clutches, not heavy drums, are accelerated . . . cool-running, because finned drums rotate continuously. Fast swings save time . . . make each shift more productive.

KOEHRING COMPANY

Subsidiaries: PARSONS
KWIK-MIX • JOHNSON

BIGGER PAYLOADS

- **Faster operation**
- **Lower maintenance costs**
- **Longer life**

Here's why:

1 All-welded construction gives lower center of gravity . . . improves bucket balance . . . concentrates digging power on lips and teeth for maximum penetration and capacity loads every time.

2 Weight, saved in other parts by welding, is put back into thick sides, lips and bottom, where extra strength is needed to take constant pounding of hard, fast drops. Strain points are reinforced.

3 Hard manganese cutting edge, welded to heavy lips stays sharp . . . gets tougher with use. Long wearing, maintains big capacity payload digging efficiency.

4 Stones and dirt from heaped capacity loads can't get at sheaves, cables and lower sheave block. Open lower sheave frame keeps sheave spaces clean; material cannot collect under sheaves.

5 Every big closing sheave runs on two needle bearings, which eliminate friction losses . . . keeps sheaves free-running. Effective seals keep dirt and moisture out.

6 Johnson clamshell buckets dump fast and clean . . . not a single projecting rivet or bolt head inside the smooth, all-welded clams to catch and hold clay or mud. Materials slide out easily.

Ask your Johnson distributor about the Wide Rehandling, General Purpose and Heavy-Duty Digging types available in sizes from ⅜ to 2½ yards.

MILWAUKEE 10, WISCONSIN

C. S. JOHNSON COMPANY

KOEHRING SUBSIDIARY • CHAMPAIGN, ILLINOIS

Ryerson Answers Important Steel Questions

What can we get?

You can usually get enough carbon, alloy or stainless steel from stock to meet maintenance and repair requirements—and some new equipment needs as well. Tremendous demand often limits the amount that can be shipped, but stainless is in particularly good supply—in fact both alloy and stainless bar stocks and carbon and stainless tubing stocks are better than average. See the product list below.

Where can we get it?

For next-door steel service, call your nearest Ryerson plant or office. The nationwide network of Ryerson plants brings steel stocks within short shipping distance of almost any delivery point. As an added convenience for steel buyers, Ryerson maintains sales offices in many cities, connected by direct wire to a neighboring plant.

When can we get it?

When the steel you need is on hand, you get delivery promptly from Ryerson—24-hour service in emergencies. If your requirements are not immediately available, we may be able to suggest workable alternates. We will certainly do our best. And remember, our stocks turn over quickly. We may have kinds and sizes tomorrow that are out of stock today.

So call our nearest plant or office when you need steel. We will be glad to work with you.

Joseph T. Ryerson & Son, Inc. Steel-Service Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco.

PRINCIPAL PRODUCTS:

BARS—Carbon & alloy, hot rolled & cold fin., reinforcing
STRUCTURALS—I beams, H beams, channels, angles
PLATES—Sheared & U. M. Inland 4-Way Floor Plate
SHEETS—Many types
TUBING—Seamless & welded mechanical & boiler tubes
STAINLESS—Allegheny sheets, plates, bars, tubes, etc.
BABBITT—bearing metal
MACHINERY & TOOLS—for metal fabrication

RYERSON STEEL

One P&H after another

These two P&H Model 1400 Electric Shovels (4 cu. yard capacity) team up in this open pit mine at Tahawus, New York for the National Lead Company.

Yes, the new P&H Electric Shovels are following each other quickly these days — in one location after another. You'll find the reasons for it in P&H's Added Values.

"Magnetron" control is a typical example. Here, through the ingenious use of a proven magnetic principle within the controllers themselves, P&H has achieved stepless power regulation — smoother than you've ever known — for all motions in crowd, hoist, swing, and propel. What's more, multiple electrical contacts, resistor panels and separate exciters are entirely eliminated. And there are no terrific electrical surges to invite burn-outs and trouble.

Add to this, P&H's Magnetorque drive, independent propel, air-filtered cab and other outstanding advancements. Leadership in design means leadership in performance. Send for literature!

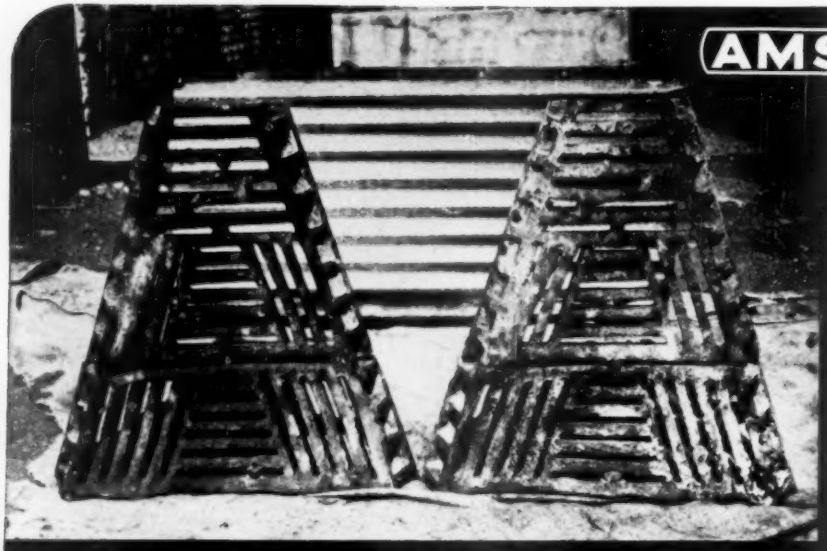
P&H Excavators are built in sizes from ½ to 6 cu. yds. — Gasoline, Diesel and Electric power.

P&H ELECTRIC SHOVELS
4465 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

Every Third P&H Electric Shovel Sold Is a Repeat Order

LEADING THE FIELD IN ELECTRIC SHOVEL DEVELOPMENT



AMSCO®

Unretouched illustration of Amsco special manganese steel grates . . . after handling 193,797 tons of gold bearing quartz rock in ball mill.

BALL MILL GRATES

after 193,797 tons

Where operations involve impact and abrasion, you will find Brake Shoe facilities a sure source for wearing parts that will stand up longer . . . to give you important reductions in operation cost.

A case in point is the grates used in ball mills. In one application Amsco special manganese steel grates handled a total of 193,797 tons of gold bearing quartz rock . . . without requiring repair of any kind. In addition, slot peening and "blinding" were so little that an acceptable grind was obtained throughout the operating period. In another comparable installation, with Amsco special manganese steel grates, a total of 176,360 tons of quartz rock was handled at a cost of $0.00369 per ton. An important factor was demonstrated here also: while the previous grates gave a 136,923 ton service life, repair was required during this period totalling 29¼ hours; this lost time cost an estimated $200.00 per hour in lost tonnage.

The reason for such outstanding performance with Amsco parts is threefold: (1) Brake Shoe metallurgical research in manganese steel and other alloys makes possible the selection of the best steel or iron to cope with the specific job conditions; (2) Amsco application experience supplementing that of the mill operator often results in design improvements that alone can greatly lengthen operating life; and (3) Amsco foundry practice produces castings with uniform grain structure and dimensional accuracy.

If you think that your mill grates, liners or feeder lips are costing you too much per ton of ore ground, we may be able to help in the solution of your problem. All uses for Amsco alloy steels in metal mines and mills are described in Bulletin 743-M.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.

DU PONT QUARRY BLASTING PLAN OFFERS THREE ADVANTAGES

MAXIMUM SAFETY

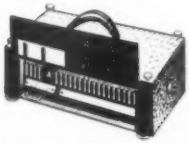
REDUCED VIBRATION

BETTER FRAGMENTATION

1.

MAXIMUM SAFETY

The Du Pont Quarry Blasting Plan for more economical, efficient, safer quarry blasting utilizes Du Pont "Nitramon"* and "Nitramex,"† the safest blasting agents available. Both are primed with "Nitramon" Primers, which are relatively insensitive. These, in turn, are detonated with Primacord, making the safest possible blasting combination. No caps needed on the job until all holes are completely loaded and stemmed. All electrical connections are made and tested before caps are attached to the Primacord lines in the holes.



2.

REDUCED VIBRATION

Vibration is reduced by split-second delay firing of the holes, accomplished with the Du Pont Blasting Timer (see description at right). Voltages of 110, 220, 440 or 550 may be used. Extensive tests with vibration recording instruments have proved conclusively that this device greatly reduces ground vibration from blasting.

3.

BETTER FRAGMENTATION

A firing switch actuates the Blasting Timer, which fires the individual holes or groups of holes in split-second succession. And, in practically every instance, fragmentation is improved, resulting in lower over-all production costs and substantial reduction in secondary blasting.

Ask any Du Pont Explosives Representative in your area for complete information about this efficient, safer, Du Pont Quarry Blasting Plan.

E. I. DU PONT DE NEMOURS & CO. (INC.)
EXPLOSIVES DEPARTMENT,
WILMINGTON 98, DELAWARE

* Reg. Trade-mark for nitrocarbonitrate blasting agent
† Trade-mark for Du Pont ammonium nitrate blasting agent

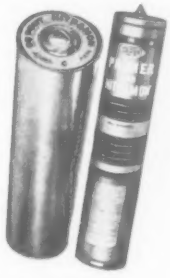
DU PONT EXPLOSIVES

(ELECTRIC BLASTING CAPS—"NITRAMON"—"NITRAMEX"—DYNAMITES BLASTING SUPPLIES AND ACCESSORIES)

Plan Utilizes These Dependable Du Pont Products

"NITRAMON"

A blasting agent so safe that it cannot be detonated with blasting caps, open flame or by friction, sudden shock, or even the impact of high-powered rifle bullets. Packed in watertight metal containers.



"NITRAMEX"

Companion product to "Nitramon." A stronger blasting agent for bottom loading in tough shooting rock—providing additional strength where it is needed.

DU PONT BLASTING TIMER

Also a product of Du Pont Explosives Research. Provides 15 circuits with a wide selection of delay intervals ranging from .010 to .025 second in increments of .005 second.

DU PONT ELECTRIC BLASTING CAPS

Three outstanding safety features:

NYLON-INSULATED WIRES

RUBBER PLUG CLOSURES

ALUMINUM FOIL SHIELDED SHUNTS

Listen to "Cavalcade of America" Monday Evenings—NBC

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

America's Choice

CHEVROLET ADVANCE-DESIGN TRUCKS

for All-Around Value!

Ask the experts—

If you ask the drivers, they'll say:

"Chevrolet Advance-Design Trucks can and will take it day after day, month after month. They're easy to handle . . . built with driver safety and comfort in mind."

The mechanics insist:

"Chevrolet trucks last longer because they're designed, engineered and built for the job. They're easier to work on . . . built with an eye to economical maintenance."

The owners will tell you:

"Only Chevrolet has the TRIPLE ECONOMY of low cost operation . . . low cost upkeep . . . and the lowest prices in the entire truck field."

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICHIGAN

Only the Leader — Chevrolet has all these features:

NEW CHEVROLET 4-SPEED SYNCHRO-MESH TRUCK TRANSMISSION

A special feature in one-ton and heavier duty models that assures new operating ease and efficiency.

THE CAB THAT "BREATHES"

Here are the trucks with the famous cab that "breathes"! Outside air is drawn in and used air is forced out! Heated in cold weather.*

FLEXI-MOUNTED CAB

Chevrolet's Advance-Design Cab is mounted on rubber, cushioned against road shocks, torsion and vibration.

IMPROVED VALVE-IN-HEAD ENGINE

The world's most economical engine for its size now has greater durability and operating efficiency.

SPLINED REAR AXLE HUB CONNECTION

Greater strength and durability in heavy-duty models with this exclusive Advance-Design feature.

PLUS Uniweld, all-steel cab construction • New, heavier springs • Full-floating hypoid rear axles on ¾-ton and heavier duty models • All-round visibility with rear corner windows* • Specially designed brakes • Hydrovac power brakes on two-ton models • Ball-bearing steering • Double-line pre-selective power shift in 2-speed axle at extra cost on two-ton models • Wide base wheels • Standard cab-to-axle-length dimensions • Multiple color options.

**Heating and ventilating system and rear corner windows with de luxe equipment optional at extra cost.*

CHEVROLET

CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED

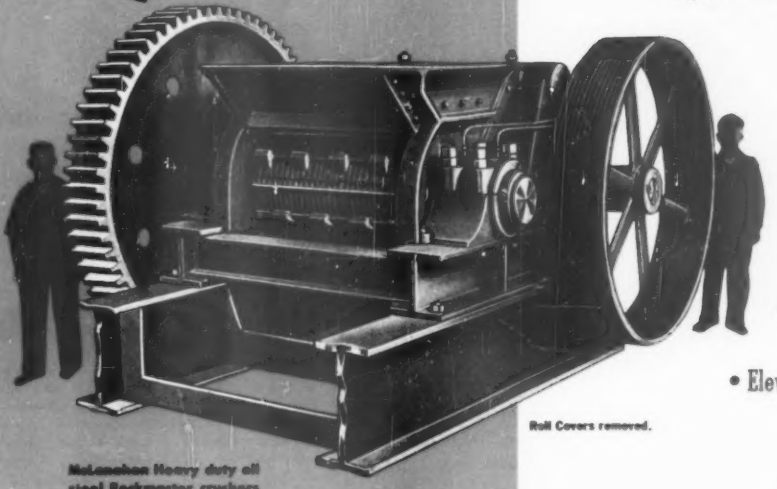
First! SINCE 1835

DESIGNERS AND BUILDERS OF ECONOMICAL

CRUSHING

and other Pit, Mine and Quarry

EQUIPMENT



Roll Covers removed.

McLanahan Heavy duty all steel Rockmaster crushers for primary and secondary work have proven outstanding in many installations for use on limestone, gypsum, shale, gravel, iron ore, open hearth slag and many other difficult crushing problems and operations.

THE THINGS WE BUILD . . .

Primary and Secondary Single and Double Roll Crushers for Every Capacity

- Jaw Crushers
- Portable and Semi-Portable Crushing Plants
- Dry Pans Super Heavy Duty
- Conveyors
- Dryers of Revolving Type
- Elevators
- Feeders
- Hoists
- Jigs
- Screens
- Washers
- Bearings
- Bin Gates
- Car Wheels
- Columns
- Elevator Buckets
- Gears
- Gratings
- Grate Bars
- Pulleys
- Rollers
- Sheaves
- Sprockets

McLANAHAN AND STONE CORPORATION

Pit, Mine and Quarry Equipment Headquarters Since 1835

HOLLIDAYSBURG, PENNSYLVANIA

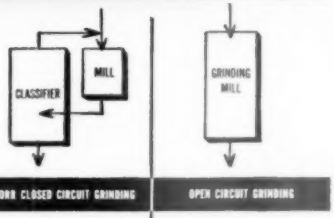
To wet process cement producers now using open circuit grinding . . .

At a 5000 barrel per day wet process cement plant now using open circuit grinding, the installation of Dorr Closed Circuit Grinding would save approximately $38,000 per year in operating expense due to reduced grinding mill ball and liner wear.

This figure is based upon operating data from mills where Dorr C.C.G. has supplanted open circuit grinding, and where careful records of ball mill steel consumption before and after conversion have been kept. The data obtained at these mills show that Dorr C.C.G. is saving an average of .361 pounds of steel per barrel of finished cement . . . a dollar saving of 2.166 cents per barrel at current grinding steel prices, or $108.30 per day for a 5000 barrel mill.

Why these results with Dorr C.C.G.? First, because it substantially increases ball mill capacity. Second, because with Dorr C.C.G., grinding steel is expended for useful work . . . not wasted on overgrinding.

This is but one of the many advantages of Dorr C.C.G. of economic interest to present users of open circuit grinding. We would welcome the opportunity to discuss them with you in detail.



DORR CLOSED CIRCUIT GRINDING

In Dorr C.C.G., raw rock is fed to a grinding mill and mill discharge is returned to a Dorr Classifier. Adequately ground material overflows the Classifier and goes on to process, while oversize is recycled back to the mill for further grinding.

OPEN CIRCUIT GRINDING

In open circuit grinding, raw rock is fed to either a single compartment or sectionalized grinding mill. As mill discharge goes directly to process, complete reduction to the desired particle size must be made in one pass through the mill.

DORRCO

THE DORR COMPANY, ENGINEERS
570 LEXINGTON AVE., NEW YORK 22, N. Y.
ATLANTA • TORONTO • CHICAGO
DENVER • LOS ANGELES
RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.
SUGAR PROCESSING
PETREE & DORR DIVISION, NEW YORK 22, N. Y.
ASSOCIATES AND REPRESENTATIVES
Dorr Technical Services and Equipment Are Also Available Through Associated Companies and Representatives in the Principal Cities of the World. Names and Addresses on Request.

RESEARCH ENGINEERING DORR EQUIPMENT

116,816,000
tons of limestone were used in construction work during 1947, plus 57,026,000 tons in industry and 23,128,000 tons in agriculture. Together with the limestone used in producing cement, it meant a busy year for Bucyrus-Erie quarry and mine shovels like the 54-B electric. Combining small shovel speed and ease of control with big shovel strength and capacity . . . with modern Ward-Leonard control for the smooth handling of shovel functions that steps up cycle speed . . . with 68 years of designing and manufacturing experience behind it — the 54-B is a "years ahead" machine that can deliver big output in tough digging hour after hour.
BUCYRUS-ERIE COMPANY
South Milwaukee, Wis.
BUCYRUS ERIE
48L47C
Greater Output...
Greater Economy
with Bucyrus-Eries!

An Important *Announcement* to the Lime Industry

The Ellicott Machine Corporation of Baltimore, Maryland, has acquired the Lime and Hydrates Plants Company of York, Pennsylvania, including all of their basic patents on which many improvements in the production of lime have been based.

Mr. William J. Kuntz will continue to be closely associated with this work as Consulting Engineer, so that his long experience in the industry will be available to our organization and to users of this equipment. We can supply owners of KUNTZ lime plant equipment with all necessary parts.

We invite inquiries covering plant improvements and new installations. They will be given the same careful attention that has characterized the company's sixty-three years of successful operation.

ELLICOTT MACHINE CORPORATION

KUNTZ LIME AND HYDRATE PLANTS DIVISION

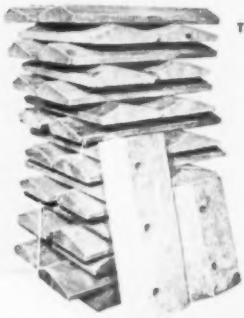
1653 Bush Street, Baltimore, Maryland, U. S. A.

Specify the steel that defies wear

TISCO *Hadfields* MANGANESE STEEL

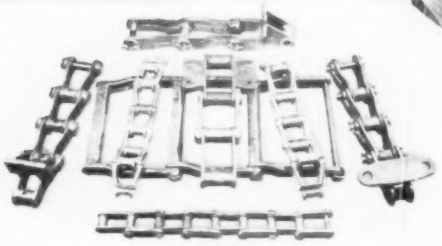
"THE HARDER IT WORKS, THE HARDER IT GETS"

TISCO Manganese Steel Pulverizer and Hammermill Parts

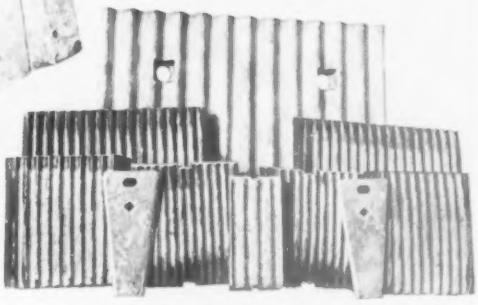


TISCO Manganese Steel Ball Mill Liners

TISCO Manganese Steel Dipper Teeth



TISCO Manganese Steel Chain for Conveyors, Elevators, Dredges, etc.



TISCO Manganese Steel Jaw Plates for Crushers

YES . . . TISCO Hadfields Manganese Steel actually gets harder, more wear resistant under the heavy impact and abrasion of crushing, hammering, pulverizing and handling rock products. Since its introduction over 50 years ago, when it made the crushing of trap and granite rock commercially possible, TISCO has proved its durability and low cost in the production of millions of tons of aggregate.

Today, TISCO Hadfields Manganese Steel continues to be the No. 1 steel for wear resistance in the quarrying industry. Long experience has developed casting and inspection techniques that assure sound castings.

When ordering new equipment or replacement parts from your supplier, be sure to specify TISCO Manganese Steel. Consult our metallurgists on any special requirements.

OTHER TAYLOR-WHARTON PRODUCTS

Manganese-Nickel Steel Weld Rod
High Pressure Gas Cylinders
Special trackwork, frogs, crossings, switches
TIOGA Forged Steel Grinding Balls
ALNICO MAGNETS

FOUNDED TW 1742

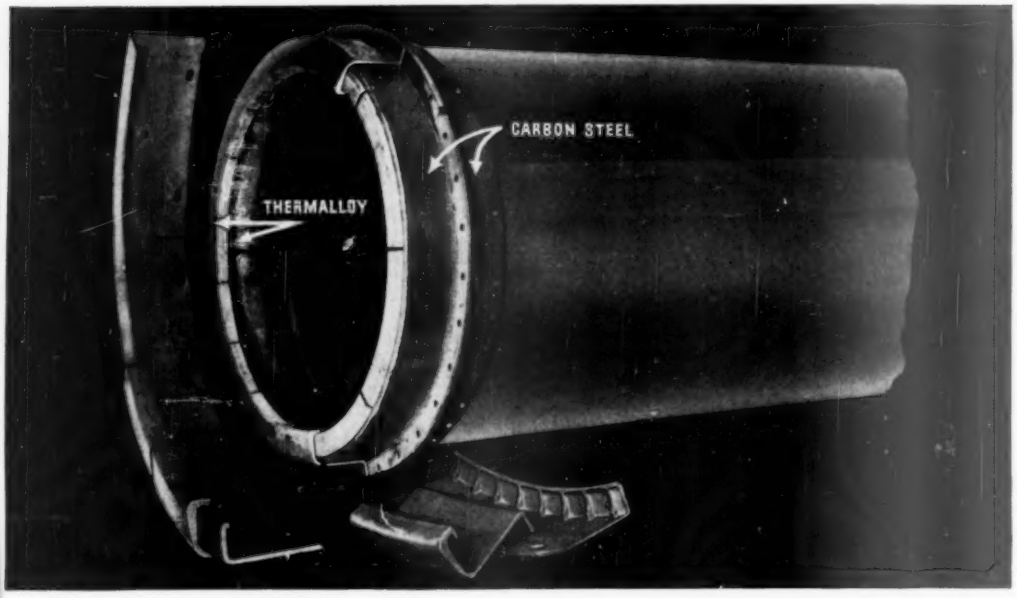
TAYLOR-WHARTON IRON AND STEEL COMPANY

HIGH BRIDGE, N. J. EASTON, PA.

TISCO *first in* MANGANESE STEEL

right...

...on the nose



. . . and you will be right if that nose ring is made of Thermalloy.

Thermalloy nose rings reduce operating costs by reducing replacement costs.

More burned clinker comes from kilns equipped with Thermalloy nose rings because they seldom have to be shut down to rebuild the discharge end. They provide for expansion and prevent excessive warping and cracking. Segments are flush with the kiln shell and do not require special brick.

Before you place an order for that next nose ring, call Electro-Alloys. Let one of our engineers show you how Thermalloy can save you money on nose rings and other kiln parts.

Thermalloy Kiln Parts Include:

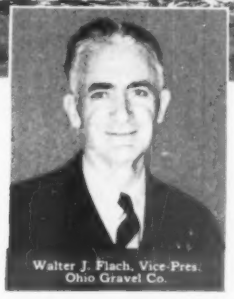
Feed Pipes	Conveyor Burner Nozzles
Chain	Feed Chutes
Outlet Grates	Kiln Shell Segments
Kiln Dampers	

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO

OHIO GRAVEL CO. likes TELSMITH

Complete plant service



Walter J. Flach, Vice-Pres. Ohio Gravel Co.

● One of the largest and most successful operators in the United States, the Ohio Gravel Co., Cincinnati, Ohio, has six large plants serving southern Ohio, Indiana and Kentucky. All are in the Cincinnati area — at Cleves, Miami, Miamiville, Newtown, Red Bank . . . and the latest all-Telsmith plant at Camp Dennison. The latter is designed for a large output of 100% crushed chips.

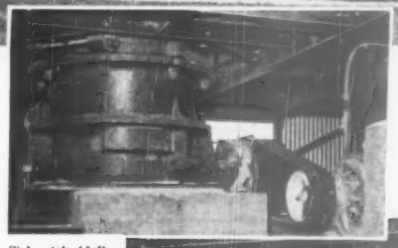
Company management is in the capable hands of Fred W. Cornuelle, President; and Walter J. Flach, Vice-President, who is in charge of plant operations and new plant construction.

Heretofore Mr. Flach has designed the plants himself, personally selected all equipment, and purchased it from several leading machinery makers. This new plant is an exception. Mr. Flach decided to try a complete gravel plant service . . . and chose Telsmith. He is very pleased with results.

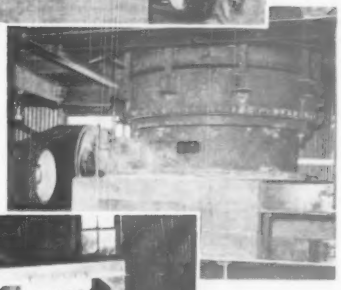
Mr. Flach gave his ideas and his preliminary layouts to Telsmith engineers. After analyzing his requirements, Telsmith submitted preliminary drawings with equipment recommendations, secured Mr. Flach's approval, then made detailed drawings for the complete plant. Telsmith equipment units were matched and balanced to assure a smooth-running plant.

Mr. Flach found that Telsmith Service relieved him of a great deal of technical detail. Installation was simpler, easier and faster. Telsmith Complete Plant Service means larger capacity, with a better product, at lower cost.

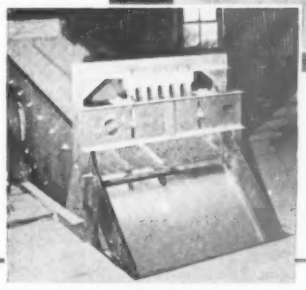
Telsmith's more than 40 years of engineering know-how are at your disposal. Consultation without cost. Send for Bulletin G-11.



Telsmith 13-B Gyratory Crusher



Telsmith 48" Fine Crushing Gyrasphere



One of the two Telsmith 4' x 12' Double Deck Vibro-King 2-Bearing Finishing Screens

G-11B

TELSMITH Equipment in this plant

• 30" x 5'-6" Special Plate Feeder • 25" x 36" Roller Bearing Jaw Breaker • 30" x 179' Plant Belt Conveyor • 5' x 12' 2-Deck Pulsator 4-Bearing Scalping Screen • 13-B Gyratory Crusher • 48" Fine Crushing Gyrasphere • No. 8 Belt Elevator 76' ctrs. • Two 4' x 12' 2-Deck Vibro-King 2-Bearing Finishing Screens • Four 16" x 18" Siquad Bin Gates • 24" x 279' Stockpiling Belt Conveyor with Tripper

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. New York 17, N.Y. — 211 W. Wacker Drive Chicago 6, Ill. — 713 Commercial Trust Bldg. Philadelphia 2, Pa. — 238 Main Street Cambridge 42, Mass. — Boehek Eqpt. Co. Milwaukee 3, Wis. — Henry M. Wood Co. Cincinnati 6, Ohio

Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash. • General Machinery Co., Spokane 1, Wash. • Brandeis Machinery & Supply Co., Louisville 8, Ky. • Rish Equipment Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

How... RAYMOND Flash DRYING

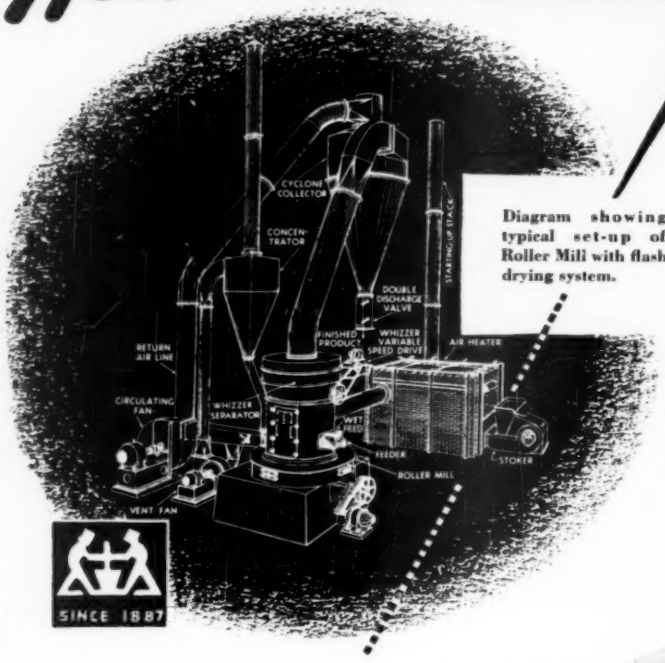
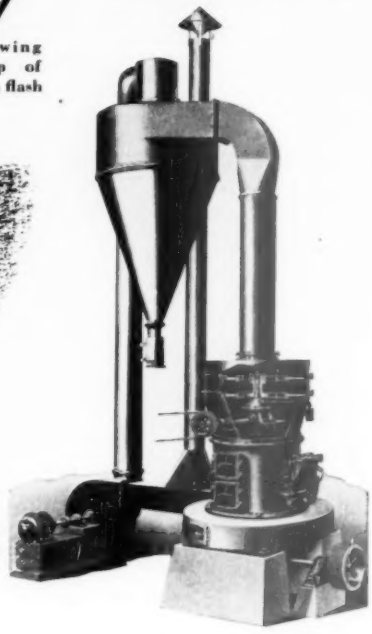


Diagram showing typical set-up of Roller Mill with flash drying system.



Raymond High Side Roller Mill with whizzer separator.

simplifies many...

GRINDING PROBLEMS

The following are typical operations:

Grinding barytes **to 98% passing 325-mesh and removing moisture from material as fed.**

Pulverizing limestone **to fineness ranging from 20-mesh to 99.9% or better passing 325-mesh, with simultaneous drying.**

Using the same principle, *sulphur* can be ground in the mill by introducing CO_2 gas.

Write for further details

You can economically grind such materials as limestone and clay, containing initial surface moisture, by using a *flash-drying-equipped* Raymond Roller Mill. The moisture is evaporated while the product is pulverized to the specified fineness.

This method saves double handling of the material, eliminates separate dryers, and cuts down the time of processing. It has the advantage of flexibility in arrangement so that the equipment can be adapted to any plant layout.

If you have a similar problem in grinding and drying any special materials, tell us your requirements.

COMBUSTION ENGINEERING—SUPERHEATER, INC.
RAYMOND PULVERIZER DIVISION
1307 North Branch Street, Chicago 22, Ill.
Sales Offices in Principal Cities
Canada: Combustion Engineering Corp., Ltd. Montreal

low cost wear-proofing with STOODY SELF-HARDENING 21* *and* STOODY 1027*

For protecting bucket lips and teeth, there is no equal for Bare STOODY SELF-HARDENING 21. Here's why: it is unmatched for speed of application; you get heavy buildups in a single pass; there is no slag interference. Bare Stoody Self-Hardening 21 runs as easily as coated on D.C. equipment—can also be applied with A.C. machines. And its exceptional abrasion resistance keeps lips and teeth out to size, biting a full pay load on every scoop. Life is usually doubled over unprotected buckets.

To save bucket sides, as well as other areas not easily positioned, apply stringer beads of STOODY 1027. It handles smoothly on all position welds with A.C. or D.C. equipment, deposits rapidly without slag interference and provides good wear resistance.

*

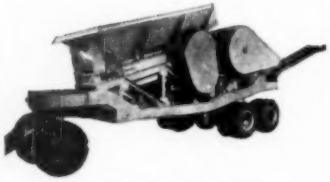
Both Stoody Self-Hardening 21 and Stoody 1027 are low-cost alloys, yet under actual tests have outperformed many higher priced rods. Try 50 lbs. today! Call your nearest Stoody dealer for detailed information. Literature is available.

STOODY COMPANY
1129 W. SLAUSON AVE., WHITTIER, CALIF.

Heavy Duty GRUENDLER
ROCK & GRAVEL EQUIPMENT

Plan now for Spring! Investigate the GRUENDLER Line. None Finer. 63 Years of Engineering Experience producing the last word in Stationary & Portable Plants.

Write for our latest Literature!



PORTABLE PRIMARY CRUSHER
15 x 36; with Apron Feeder & Air Brakes

PORTABLE SCREENING & CRUSHING PLANT
pneumatic tires & brakes

Here are a few GRUENDLER units available for early Delivery: subject to prior sale.

CALIFORNIA STOCK

2—10" x 16" Jaw Crushers
2—XXXB (30" x 24") Hammermills
1—24" x 36" Jaw Crusher
2—20" x 36" Jaw Crushers
1—36" x 10' Apron Feeder
1—40" x 24" Double Roll Crusher

WASHINGTON STOCK

1—24" x 36" Jaw Crusher

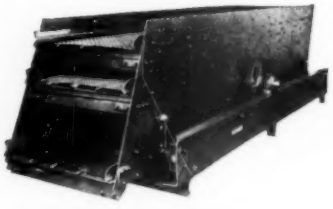
ST. LOUIS FACTORY STOCK

1—24" x 36" Jaw Crusher
2—20" x 36" Jaw Crusher
1—15" x 36" Jaw Crusher
1—10" x 16" Jaw Crusher
1—10" x 24" Jaw Crusher
1—40" x 24" Double Roll Crusher
1—30" x 18" Double Roll Crusher
1—24" x 18" Double Roll Crusher
1—30" x 8' Apron Feeder
1—36" x 10' Apron Feeder

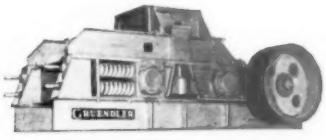
ST. LOUIS FACTORY STOCK (Cont'd)

1—18" Reciprocating Feeder
1—24" Reciprocating Feeder
1—XXB (24" x 20") Hammermill
1—XXXB (30" x 24") Hammermill
1—XXXD (30" x 36") Centerfeed Hammermill
1—XXC (24" x 24") Hammermill
1—50 TPH Rock (75 TPH Gravel) Combination Portable Plant complete with 20 YD, 2 compartment, Portable Bin. (Plant arranged for light duty, washing and sand revolving with sand drag.)
1—Gravel Screening Plant, 80 to 100 TPH Capacity, producing four sizes, including washed and dehydrated sand.
1—20" x 36" Portable Primary Plant

REDUCTION JAW CRUSHER
30 x 42 roller bearing



TRIPLE DECK VIBRATING SCREEN
4' x 14' roller bearing



HEAVY DUTY DOUBLE ROLL CRUSHER
40" rolls; roller bearing

GRUENDLER CRUSHER & PULVERIZER CO.

MANUFACTURING ENGINEERS

2917 North Market Street - - - - - St. Louis 6, Mo.

Performance-Proven

POWER PLANTS

International Diesels are *performance-proven.* They have given remarkably dependable and economical service as the engines in International Diesel Crawler tractors. There just isn't any rougher work for an engine. Heavy loads, tough working conditions and long hours of operation all combine to give a crawler tractor engine a real going over.

Make no mistake about it. International Diesels are *performance proven.* You can be sure that you get full measure of profit-producing power from any International Diesel you select.

See your International Industrial Power Distributor or Dealer about your power requirements. He handles the full line of International Diesel and gasoline power units listed at the right.

He will be glad to help you select the right International Power Unit for your specific requirements. And you'll get the benefit of profit-producing power.

INTERNATIONAL HARVESTER COMPANY
180 N. Michigan Avenue, Chicago 1, Illinois

INTERNATIONAL ENGINES are available as complete power units in the following models:

DIESEL:	UD-24	180 h.p. @	1375 r.p.m.
	UD-18A	125 h.p. @	1600 r.p.m.
	UD-16	100 h.p. @	1800 r.p.m.
	UD-14A	76 h.p. @	1400 r.p.m.
	UD- 9	53 h.p. @	1500 r.p.m.
	UD- 6	39 h.p. @	1500 r.p.m.
GASOLINE:	U-9	55 h.p. @	1500 r.p.m.
	U-6	41 h.p. @	1500 r.p.m.
	U-4	31½ h.p. @	1800 r.p.m.
	U-2	22 h.p. @	1800 r.p.m.

Write for informative catalogs on International Power Units:
Form **A-54-LL**
INTERNATIONAL ENGINES AND POWER UNITS
Gas, Gasoline or Distillate
Form **A-231-LL**
INTERNATIONAL DIESEL ENGINES AND POWER UNITS

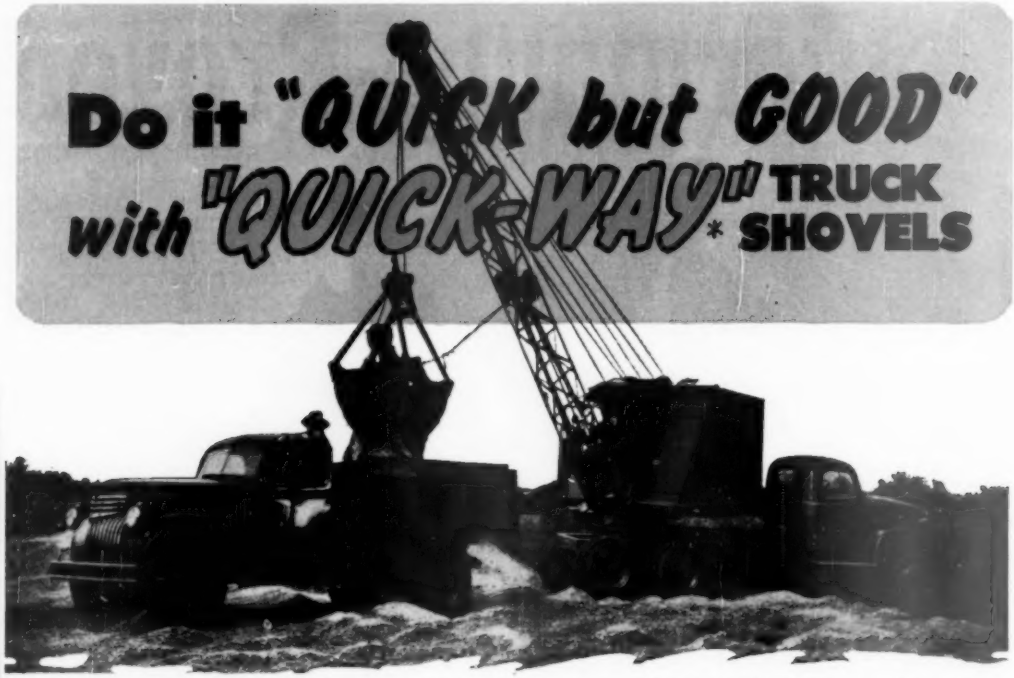
Listen to James Melton on "Harvest of Stars" every Wednesday evening—CBS

Standardize on Power that Pays

INTERNATIONAL
INDUSTRIAL POWER

CRAWLER TRACTORS
WHEEL TRACTORS
DIESEL ENGINES
POWER UNITS

Do it "QUICK but GOOD" with "QUICK-WAY"* TRUCK SHOVELS



Whatever the job, a *"QUICK-WAY"* will do it both QUICK and GOOD. What's more, a *"QUICK-WAY"* will move to the next job and be hard at work in record time.

"QUICK-WAY" Truck Shovels are built to travel with any of your other mobile equipment — anywhere a truck can go, at truck speed. Quality steel is used throughout to cut dead weight and improve strength and durability.

"QUICK-WAYS" are built low for stability on the job and on the road, clear low underpasses.

All parts are simple and easy to get at; this holds servicing time and expense at the minimum. Many working parts are interchangeable for easier, cheaper maintenance.

Best of all, a *"QUICK-WAY"* is many machines in one. Attachments are removed and replaced IN MINUTES to convert your *"QUICK-WAY"* from SHOVEL to CRANE, DRAGLINE, CLAMSHELL, PILE DRIVER, TRENCH-HOE, BACKFILLER or SCOOP. For speed, portability, economy of operation, and adaptability to a wider range of jobs, nothing of comparable size equals a *"QUICK-WAY"* Truck Shovel. There's a *"QUICK-WAY"* owner near you; ask HIM.

* Reg. U. S. Pat. Off.

"QUICK-WAY"

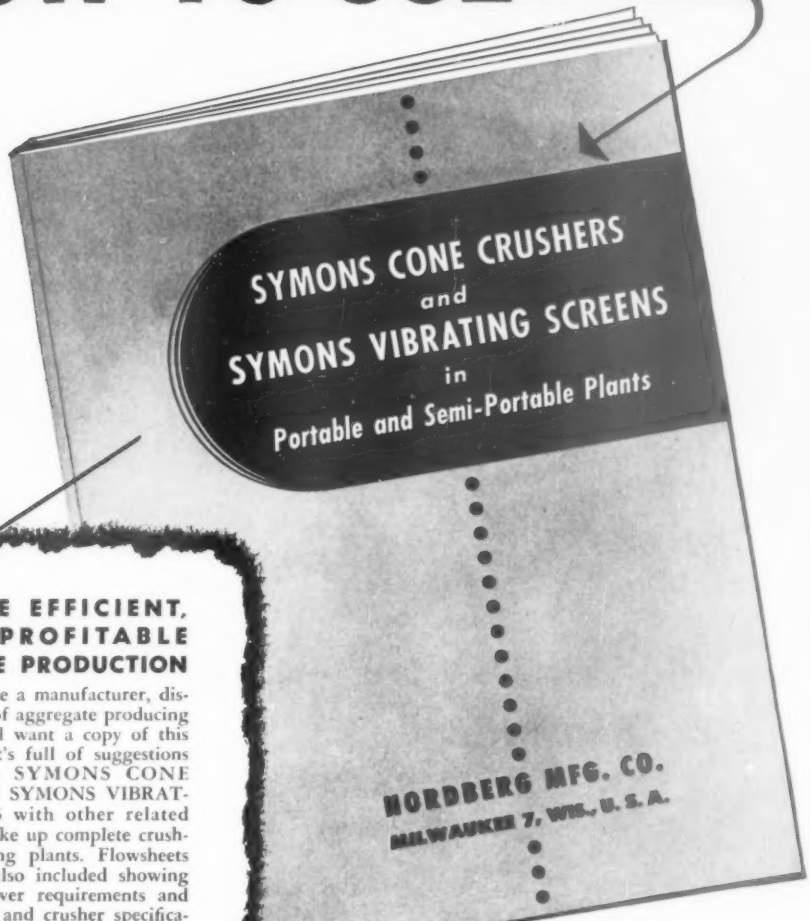
Model E: 4/10 cu. yd. cap., mounts on standard 5-ton truck.

Model J: 1/2 cu. yd. cap., mounts on standard 1½-ton truck.

"QUICK-WAY" TRUCK SHOVEL CO.

DENVER, COLORADO

HOW TO USE



MORE EFFICIENT, MORE PROFITABLE AGGREGATE PRODUCTION

Whether you're a manufacturer, distributor or user of aggregate producing equipment, you'll want a copy of this new brochure. It's full of suggestions for arranging SYMONS CONE CRUSHERS and SYMONS VIBRATING SCREENS with other related equipment to make up complete crushing and screening plants. Flowsheets and tables are also included showing set-ups, horsepower requirements and conveyor, screen and crusher specifications for various hourly production capacities that will meet your needs. Fill in the coupon and mail it today for your free copy.

NORDBERG MFG. CO.

MILWAUKEE 7, WIS., U. S. A.

SYMONS
CRUSHERS — SCREENS

15

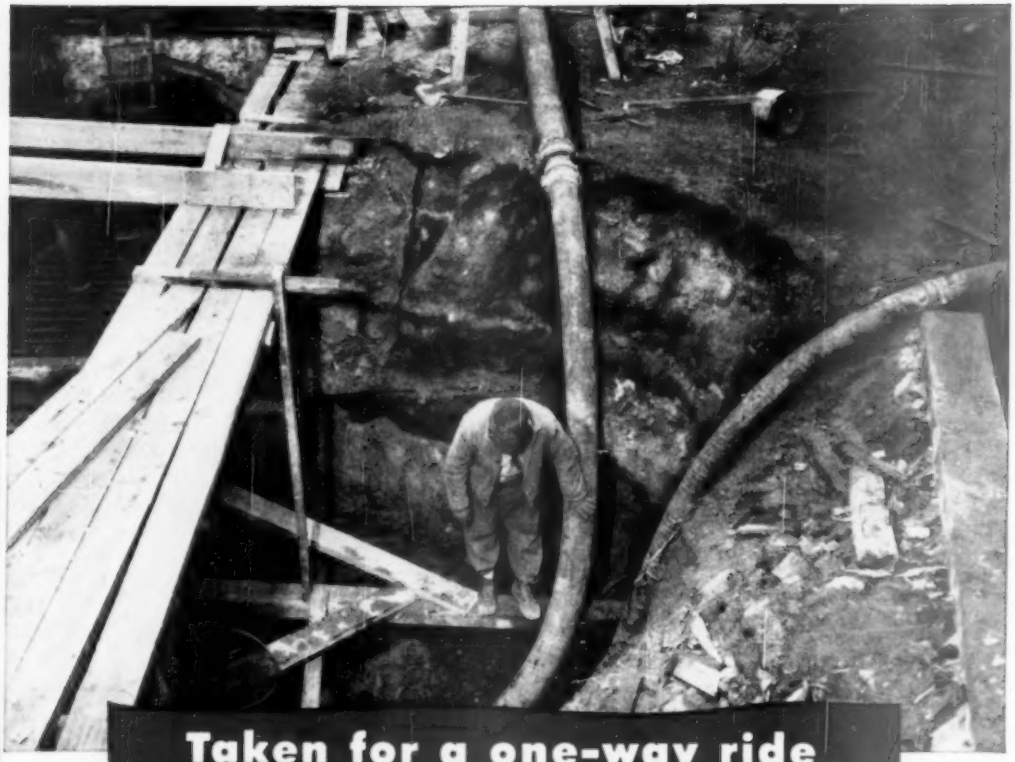
NORDBERG MFG. CO.
Crusher Division
Milwaukee 7, Wisconsin

Please send me brochure on Symons Crushers and Screens for use with portable and semi-portable materials producing plants.

NAME_____

STREET ADDRESS_____

CITY_____ STATE_____



Taken for a one-way ride

Tough, sturdy Hewitt Water Suction Hose removes waste water quickly, surely

The hose pictured above is taking an "undesirable" for a one-way ride.

It's being used to pump out seepage water that collected in the excavation. This type of job calls for a dependable, heavy-duty water suction hose. And flexible, rugged Monarch Water Suction Hose is just that kind!

It's built by Hewitt Rubber to "take it" . . . even under constant exposure to wear and abrasion. You can count on it to handle high vacuums without ply separation. You can be sure that water will flow through it quickly and positively with practically no frictional resistance. And you can rely on the tough cover to resist abrasion.

For your difficult drainage operations, insist on Hewitt Monarch Water Suction Hose. You'll find it's the right hose for better, more economical service. For further information call the Hewitt distributor listed in the yellow pages of your phone directory. Or write Hewitt Rubber Division, 240 Kensington Avenue, Buffalo 5, New York.

HEWITT

Water Suction Hose

4 REASONS WHY HEWITT WATER SUCTION HOSE IS THE BEST

❶ Spring-steel wire reinforcement in carcass assures protection against collapse under heavy suction.

❷ Thick inner tube especially compounded to resist the scouring action of muddy waters.

❸ Smooth internal fluidway provides swift water-flow.

❹ Tough, abrasion-resistant cover specially constructed to withstand constant exposure to weather.

HEWITT RUBBER DIVISION **HEWITT-ROBINS INCORPORATED**

"Take it from me"...

SAY THE MEN WHO OWN

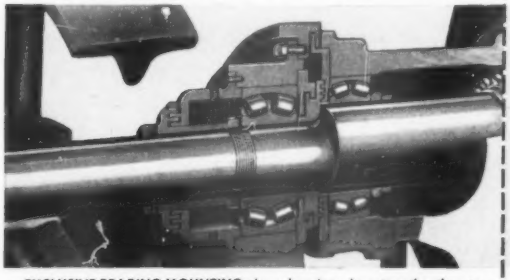
Pioneer Jaw Crushers

DOWN AT AMARILLO, TEXAS, Tom Poppewell, President of Panhandle Sand & Gravel Co., has an "all-Pioneer" crushing, screening and washing plant for gravel. His 1536 Pioneer Jaw Crusher helps turn out 125 yards of washed material in a nine hour day.

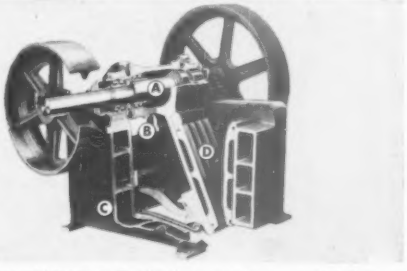
AT SWANNANOA, NORTH CAROLINA, a 2436 Pioneer Jaw Crusher helps the Grove Stone & Sand Co. produce 1800-2000 tons of crushed material a day. J. G. Northcutt, general manager, says, "Our Pioneer Jaw Crusher has given us excellent service!"

NEAR LATROBE, PENNSYLVANIA, the Latrobe Construction Co. produces crushed rock to meet three state specifications simultaneously with a Pioneer 3042 Jaw, a 54 x 24 Roll and a 4' x 16' Tandem Vibrating Screen. Ask President Bruno Ferrari . . . he's a Pioneer booster!

LIVE IN OHIO? Then ask O. L. Ohnstad of the Fayette Limestone Quarries about his Pioneer 3042 Jaw Crusher . . . his 12' Pioneer Apron Feeder . . . and his battery of Pioneer Vibrating Screens. He'll tell you, "Our production is considerably in excess of what we anticipated."



EXCLUSIVE BEARING MOUNTING places bearings closer together than on any other anti-friction primary, reducing strain on the shaft. The extra large machined steel shaft turns on SKF self-aligning bearings that absorb flexing and end thrust without damage to shaft or bearings.



HIGH OUTPUT FEATURES: A. Overhead eccentric forces material down and through, increasing output. **B.** Simple adjustment changes size of product without shutdown. **C.** Double wall welded box construction. **D.** Reversible manganese steel jaw plates shaped for maximum capacity.

Pioneer

Continuflo EQUIPMENT

PIONEER ENGINEERING WORKS

1515 Central Avenue • Minneapolis 13, Minnesota

Please send me the following information:

- ☐ Location of nearest Pioneer plant
- ☐ Vibrating Screen Catalog
- ☐ Jaw Crusher Catalog
- ☐ Roll Crusher Catalog

Name_____

Address_____

City_____ State_____

More tons per day
More hours of trouble-free operation
More profits
} **and Lower Costs . .**

PORTABLE CRUSHING and SCREENING PLANTS

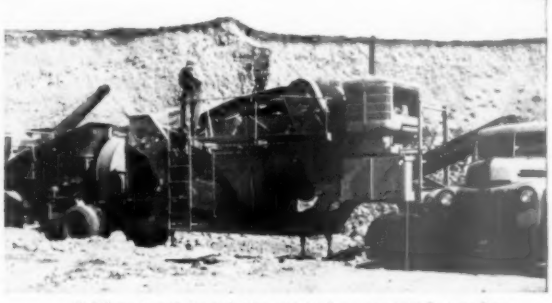
The Cedarapids Master Tandem — master of aggregate producing jobs. Put a portable primary ahead of it and you have a complete quarry plant ready to do double duty for you. Operators report 150 tons an hour average production.

A Unitized Plant set up almost in the middle of an Oregon forest, typifies the portability and adaptability of Cedarapids equipment. Take it where you need it and put it to work in a hurry. Capacities of 250 tons per hour . . . and more . . . to meet any specifications.

One of the most popular of the Cedarapids line is the Junior Tandem with many contractors telling of production of more than 110 tons per hour, crushing to ⅜" with 75% of the material needing reduction. Big capacity and low cost at its best.

OPERATORS everywhere report they are getting larger volume production, greater flexibility and more hours of trouble-free operation with Cedarapids portable crushing and screening plants.

The installations shown are typical of Cedarapids equipment everywhere. With their large capacity and wide product diversification, they turn out better products at lower cost with very low maintenance. These plants are made up of Cedarapids matched crushers, screens and conveyors — balanced and coordinated for the most efficient operation. They are built in sizes and types to fit every product requirement, so regardless of the size of the job, you'll make more profit per ton with Cedarapids equipment.



In Wisconsin, a Cedarapids Pitmaster produces aggregates for secondary roads — There's lots of crushing capacity in the 10" x 16" jaw crusher and 16" x 16" roll crusher. Cedarapids horizontal vibrating screen assures the accurate grading required today.

Cedarapids — Built by IOWA

The IOWA LINE *of Material Handling Equipment Includes:*

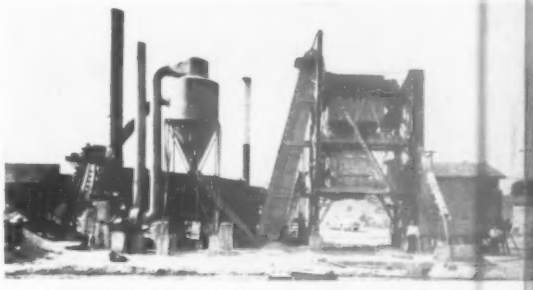
ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS – STEEL BINS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SCREENS • STRAIGHT LINE ROCK AND GRAVEL PLANTS • FEEDERS – TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE PLANTS • PORTABLE GRAVEL PLANTS • REDUCTION CRUSHERS • BATCH TYPE ASPHALT PLANTS • HAMMERMILLS • DRAG SCRAPER TANKS • WASHING PLANTS • SOIL COMPACTION UNITS • STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREAKERS • *See Your Cedarapids Distributor For Full Details*

...with Cedarapids Equipment!

BITUMINOUS MIXING PLANTS

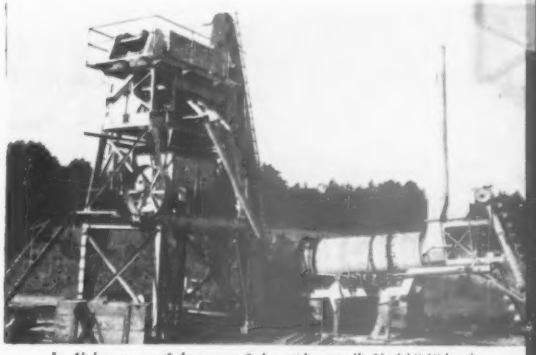
THESE bituminous mixing plants are typical of Cedarapids plants everywhere... producing a constant flow of a variety of bituminous mixes for building dependable, all-weather roads and streets. Each feature is built for simplicity of operation, maximum efficiency and easy portability. They'll deliver more tons per hour and they'll not only do it better, but at a lower cost. Made up of matched screens, pugmills, elevators and other component parts, Cedarapids Bituminous Mixing Plants produce thoroughly mixed materials, with each particle of aggregate completely coated with bitumens. When buying bituminous mixing plants, buy the best. Buy Cedarapids — a complete line of batch-type and volumetric-type mixing plants.

300 to 400 tons per day of thoroughly mixed bituminous material is the average of this Cedarapids Model "FA" super-portable batch-type plant. With drier and dust collector, you can meet the most exacting specifications.



Cedarapids Model "E" with dust collector in Pennsylvania produces large volume of accurately batched and thoroughly mixed black top for roads and airports at remarkably low cost, and it's portable, too.

30 to 50 tons per day of patching material is the job for a Cedarapids Patchmaster. It's a real low cost, lightweight, profit maker that you can use as portable or stationary continuous-mix plant. The Master Mixer—also a continuous mix type — has a capacity of 100 to 150 tons per hour.



In Alabama, one of the newest Cedarapids 1,000 lb. Model "A" batch-type plant turns out 75 to 100 tons per day. Here's a plant you can set up quickly for all your medium-sized jobs.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

ECONOMICAL AIR

wherever you need it

For highway, bridge, dam, or building construction — *wherever* compressed air is needed — a CP Portable Compressor meets air demands *most economically*.

Fuel consumption is held to a minimum because the engine speed keeps exact pace with air demands, thanks to the CP gradual speed regulator. This and other CP features effect fuel savings of 15% to 35%.

On the CP-500 Diesel-driven compressor illustrated, the six-cylinder Caterpillar D-13000 engine and the V-8 arrangement of compressor cylinders are further features that make for smooth, economical performance.

CP Portable Compressors are available in gasoline-driven models of 60, 105, 160, 210 and 315 c.f.m., actual capacity, and in Diesel-driven models of 105, 160, 210, 315 and 500 c.f.m. Write for full information.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

AIR COMPRESSORS • ELECTRIC TOOLS • PNEUMATIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

"My FORD is the BEST truck I ever OWNED"

Roadside Report

FORD TRUCKS

IVAN HOBBS

FINDLAY, OHIO

"MY F-7 FORD dump truck has already given me 7,000 miles of top service, and I haven't babied it either," reports Ivan Hobbs who uses his truck in construction work in the Findlay, Ohio area.

"My usual load is 18,000 lbs. of crushed stone and my hauls are under all kinds of conditions. My Ford is the best truck I ever owned and I bought it because my previous Ford Trucks lasted longer and cost me less to operate."

Thus does Mr. Hobbs add his voice to a nationwide chorus of Ford Truck enthusiasts. Truck users everywhere are pepped up about Ford Truck performance. They love the luxury of the new Ford Million Dollar Cab. And they get the biggest bang out of Ford Bonus Built construction . . . the superstrong construction that contributes to long truck life. Life insurance experts prove Ford Trucks last longer.

ONLY THE FORD BIG JOB HAS ALL THESE FEATURES!

- ★ New 145-h.p. Ford V-8 engine for top performance.
- ★ Ford exclusive concentric dual-throat carburetor for more power, more economy.
- ★ New heavy duty 5-speed transmissions for operating flexibility.
- ★ Big Ford 16-inch by 5-inch rear brakes in the F-8; 16½-inch by 3½-inch in the F-7.
- ★ Ford Super Quadrax 2-speed axle with vacuum shift for performance flexibility in Model F-8 (single speed axle also available); single-speed Quadrax Hypoid Axle in Model F-7.
- ★ Large diameter (10-inch) wheel bolt circle with 8 studs to allow for extra-strong hub construction.
- ★ Million Dollar Cab with Ford Exclusive Level Action suspension for greater driving comfort.
- ★ Nationwide service from over 6,400 Ford Dealers.
- ★ Ford Bonus Built construction for long truck life.

Gross Vehicle Weight Ratings: F-8 up to 21,500 lbs., F-7 up to 19,000 lbs. Gross combination ratings: F-8 up to 39,000 lbs., F-7 up to 35,000 lbs.

FORD 1949 *Bonus Built* TRUCKS 1953

BUILT STRONGER TO LAST LONGER

USING LATEST REGISTRATION DATA ON 5,444,000 TRUCKS, LIFE INSURANCE EXPERTS PROVE FORD TRUCKS LAST LONGER!

NEW SERVICE

Takes Guesswork Out of Testing!

ALLIS-CHALMERS LABORATORY AND PILOT PLANT FACILITIES CAN HELP YOU GET BETTER PROCESS EFFICIENCY

HERE IS A SERVICE that can help you now and in the years of industrial change ahead. A-C's Basic Industries Research and Testing Laboratory is dedicated to a better utilization of our basic raw materials. It can help you meet higher production costs with stepped up efficiency . . . can help you get increased production with better methods and equipment.

Through research and testing, skilled Allis-Chalmers technicians evaluate your process . . . may alter your methods to obtain a better, more economical product. Sure, precise testing procedures are based on the accumulated experience of over 100 years of building for industry.

Complete facilities for batch or continuous testing of your raw material samples are contained on five floors in this modern research center. Pilot plant facilities are available to measure accurately the commercial potentials of your proposed metallurgical, wood, chemical, grain or flour milling processes.

These modern laboratory and pilot plant facilities have contributed importantly to mining and processing methods. The scope of Allis-Chalmers engineering experience cannot be duplicated elsewhere. We charge for the use of these testing facilities — and A-C engineering guidance — but on a strictly non-profit basis, as a service to our customers. For more information write direct to Allis-Chalmers, giving a brief description of your processing problems. A 2578

A-C Pilot Plant Facilities

A-C Research and Testing Facilities

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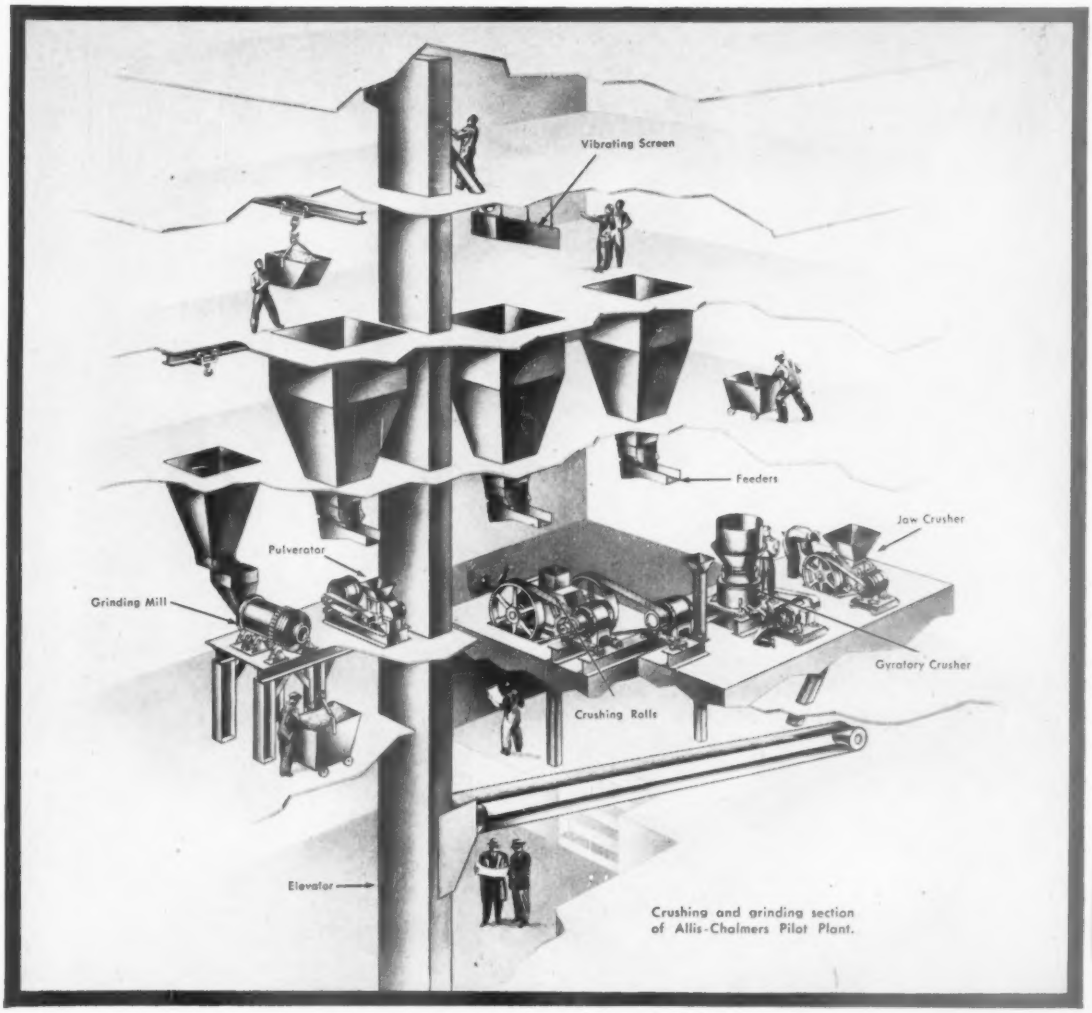
ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products



Crushing and grinding section of Allis-Chalmers Pilot Plant.

Aero-Vibe, Low-Head, Interplane are Allis-Chalmers Trademarks

CRUSHING AND SAMPLING	SCREENING AND WASHING	GRINDING AND CLASSIFICATION	CONCENTRATION	HYDRO-METALLURGY	PYRO-METALLURGY	MILLING
Jaw Crusher Gyratory Crusher Crushing Rolls Pulverator Samplers Impact Tester Compression Tester Crushability Tester	Aero-Vibe Screens Low-Head Screens Electric Screens Testing Screens Log Washer Screw Washer Blade Mill Jet Washer	Rod Mills Ball Mills Pebble Mills Attrition Mills Air Separator Rake Classifier Spiral Classifier Hydraulic Classifier	Heavy Media Jigs Tables Flotation Infrasizer Magnetic Microscopes Electrostatic	Pachuca Tanks Leach Tanks Thickeners Filters Cyclone Dewaterers Cyanidation Solvent Extraction	Hearth Roaster Pot Furnace Electric Furnace Assay Furnace Arc Furnace Rotary Kilns Preheaters	Flour Rolls Sifters Purifier Dryers Interplane Grinder Hammer Mill Roller Mill Reels

Complete laboratory and pilot scale test facilities for metallurgical research . . .

GRINDING
CRUSHING
ORE CONCENTRATION
PYRO-METALLURGY
PHYSICAL METALLURGY

Complete facilities for wood, chemical, grain and flour milling processing.

Metallographic Lab.
Spectrographic Lab.
Cement Testing Lab.
Oil and Gas Lab.
Electronics Lab.
Chemical Lab.
Ceramics Lab.
Mechanical Testing Lab.
Model shop
Library and facilities for consulting engineers

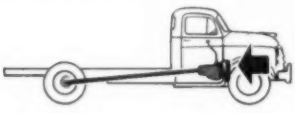
Here's what "Job-Rated" means to quarrymen...

the Right POWER

"*Job-Rated*" means your truck will have the right power.

For maximum performance, with economy, it will have the right one of 7 great Dodge truck engines. You save money on gas, oil, and upkeep.

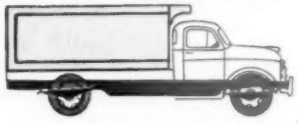
...the Right DRIVE LINE



"*Job-Rated*" means your truck will have the right driving units: Clutch, transmission, rear axle, gear ratio . . . and other load-*moving* units.

You get more efficient performance. Your truck stays *on the job*—longer.

...the Right LOAD SUPPORT



"*Job-Rated*" means the right support for your load. Frames, axles, springs, bodies, wheels and tires—all are the right size for the weight of your truck . . . and the load it hauls. Result: Your truck "stands up," and maintenance costs are low.

... in short, the Right truck to fit your job!

To get a "*Job-Rated*" truck, see your Dodge dealer.

Tell him three things: (1) The weight of your loads; (2) the type and size of body you need; (3) your grade and speed requirements.

From 248 basic chassis models, your Dodge dealer will specify a "*Job-Rated*" truck that fits your job. Every unit, from engine to rear axle, will be "*Job-Rated*" . . . engineered and built for your loads.

Such a truck will save you money . . . when you buy it, every mile you use it. And remember . . . only Dodge builds "*Job-Rated*" trucks!

FOR THE LOCATION OF YOUR DODGE DEALER, CONSULT YELLOW PAGES OF YOUR PHONE BOOK

DODGE
"Job-Rated" Trucks
FIT THE JOB . . . LAST LONGER

HERCOMITES

GELAMITES

Why they are replacing older-type explosives

High cartridge count, Hercomites* and Gelamites* are delivering explosive energy equal to that delivered by the older-type Extra Dynamites and Gelatins they are replacing . . . at considerable savings in cost. Hercomites and Gelamites are easy to handle. They are packed in handy Tamptite* cartridges that make "slitting" unnecessary and save powder. Tamptite cartridges are standard for Hercomites and Gelamites in all sizes regularly used for mining.

Write today for our new explosives booklet, "Hercomites and Gelamites for Lower Blasting Costs."

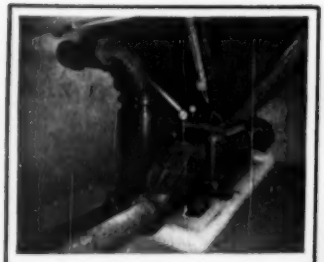
HERCULES POWDER COMPANY
INCORPORATED
946 King Street, Wilmington 99, Delaware

*REG. U. S. PAT. OFF.

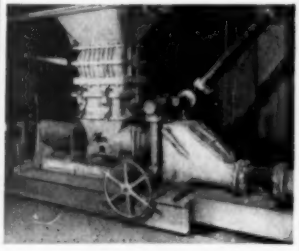
XHG-6

LIFETIME EQUIPMENT FOR

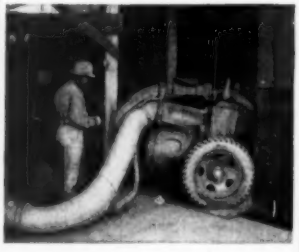
23 YEARS OF ENGINEERING AND



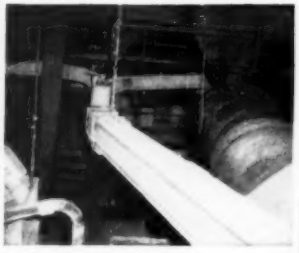
Fuller-Kinyon Stationary Pump



Fuller-Kinyon Portable Pump



Fuller-Kinyon Remote-Control Unloader



Fuller-Huron Airslide

Fuller-Kinyon Pump conveying finished cement from pulverizers to storage. Air for conveying furnished by a Fuller Rotary Duplex Single-stage Compressor, direct-connected to pump.

Starting in 1926, with only the Fuller-Kinyon Pump, used principally, at that time, for conveying finished Portland cement from pulverizers to storage, and storage to packer bins, Fuller Company has developed and built many products which have received universal approval by the cement industry.

Twenty three years, as every cement-plant operator knows, has seen many changes in the cement plant. Many of these changes were due to demands for a product of constantly increasing higher standards. These demands necessitated, in many instances, new and improved processes, and the designing and building of better and up-to-date equipment. Fuller Company can, we feel, point with pardonable pride, to its participation in the development and manufacture of equipment to produce a better product, in reducing operating costs, and bettering working conditions in many respects. Some of this equipment is shown on these pages.

CONVEYING: Fuller-Kinyon Pumps, stationary and portable, a by-word in the industry. Over 96 percent of the operating mills in the United States use this conveying system.

F-H Airslide, a revolutionary type of conveyor for transporting fine, dry materials, without the use of moving parts. It comprises an inclined porous medium, which supports a stream of material, sufficiently fluidized, by air passing through the medium, that gravitational force causes the material to flow. Has many advantages over many other types of conveyors . . . no complicated and expensive drives, such as chains, belts, speed reducers, etc. Permits flexibility of plant design, not available with straight-line conveyors.

COOLING: Fuller Inclined-Grate Cooler, for cooling cement clinker. A three-purpose cooler—abrupt air-quenching, heat-recuperation, and final cooling. One of the outstanding developments in the industry in recent years.

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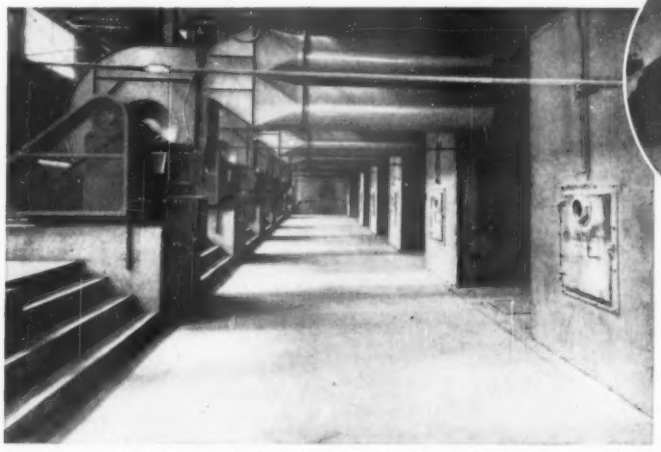
FULLER

CATASAUQUA

THE CEMENT INDUSTRY...

MANUFACTURING PROGRESS... 1926-1949



Installation of six Fuller Inclined-Grate Coolers for cooling of Portland cement clinker. Clinker temperatures are reduced from approximately 2500 deg. F. to about 100 deg. F.

Fuller Dry Pulverized-Material Cooler, for cooling finished cement before being conveyed to storage. Assures shipment of cool cement to meet specifications.

COMPRESSED AIR: Fuller Rotary Compressors and Vacuum Pumps, single and two-stage. Capacities to 3300 c.f.m., pressures to 125-lb. gage; vacuums to 29.90-in. (referred to 30-in. barometer).

FEEDING: Fuller Rotary and Vane Type Feeders, for feeding and proportioning dry pulverized and granular materials.

LEVEL INDICATION-CONTROL: Fuller Material-Level Indicator, to indicate, or control, the level of dry pulverized, crushed, and granular materials passing into or out of bins, silos, or bunker; or through a conveyor, spout, or similar device.

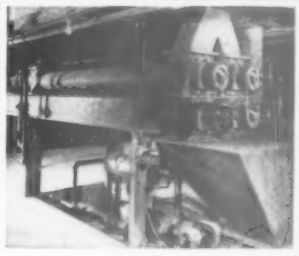
MOTION SAFETY SWITCH: A device to protect machines, equipment, and processes against damage resulting from stoppage or reduced speed.

AERATION UNITS: For reactivating, agitating, and blending finely divided materials stored in a bin or silo, using compressed air or gas as a propulsion medium.

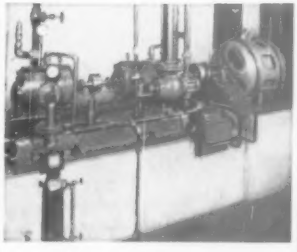
DIVERSION VALVES: For stoppage or diversion of slurry through pipe lines. Built for one-way cut-off; two-way, and three-way diversion.

ROTARY VALVES: For use under silo deck slabs and bins. Permits free flow of pulverized materials, such as cement, raw materials, and lime.

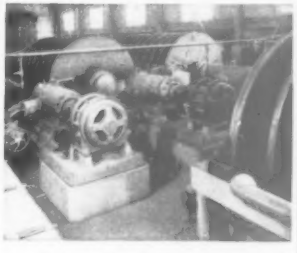
SAMPLERS: Fuller-Anderson Samplers for taking representative samples from moving streams of cement, continuously, at a uniform rate.



Dry Pulverized-Material Cooler



Fuller Rotary Compressor



Fuller Rotary Vacuum Pumps

COMPANY

PENNSYLVANIA

G-55T

SAN FRANCISCO 4
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TOUGH JOBS MOVE FASTER

with GM DIESELS

Mammoth O'Sullivan Dam (formerly called Potholes Dam) took more than 9 million cu. yds. of earth and rock fill. Toughest hauls on this rugged project were assigned to 22 GM Diesel-powered Euclid bottom dumps in the fleet owned by contractors Lytle, Amis and Green. Six-mile round trips—with half the distance on an 8% grade—were completed in an average of 23 minutes, including loading time.

ALL OVER the country you see General Motors Series 71 2-cycle Diesels taking over the hard jobs and setting records for speedy completions.

In this case, on the 8% down-grade at O'Sullivan Dam, *braking capacity* of the engine was just as important to the contractors as "power at every downstroke." Full compression braking makes the GM Diesel powered "Eucs" easier on brakes and linings.

These 2-cycle Diesels also deliver high torque that gives trucks and tractors fast get-away and smooth up-grade pull even with a punishing load.

Add these advantages to their low fuel costs and their exceptional dependability, and you have some of the reasons contractors everywhere are saying, "We pick GM Diesels for our toughest assignments."

Before you specify power for any equipment, get all the facts. Call your local GM Diesel dealer, or write us direct.

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . . . Up to 200 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS . . . Up to 800 H.P.

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

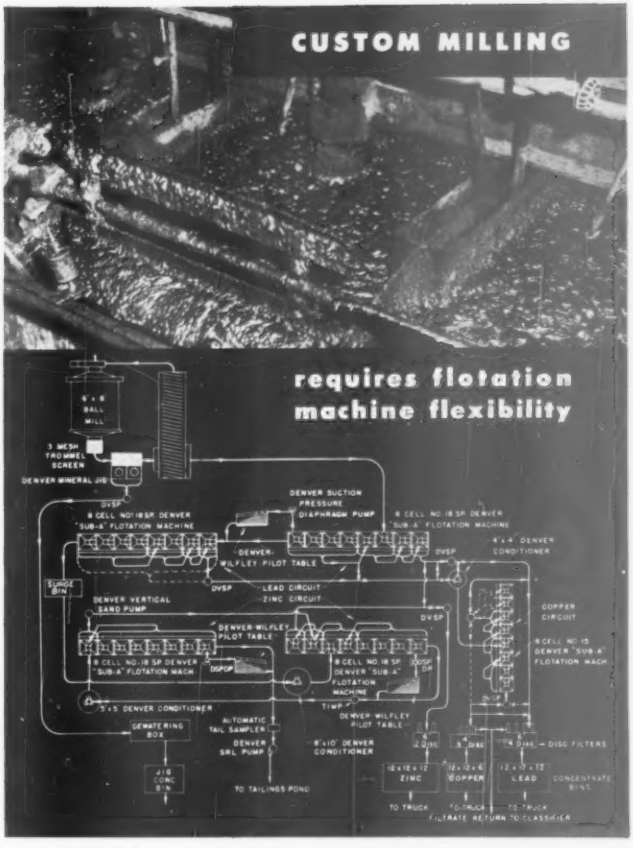
GM GENERAL MOTORS DIESEL POWER

Using Denver "Sub-A" Flotation Machines

. . . The American Zinc, Lead and Smelting Company at Ouray, Colorado, serving mines of the San Juan Triangle, are able to economically treat a wide range of complex ores in this 225-ton-per-day Denver Built Custom Mill.

FLOTATION FLEXIBILITY is the key to successful recovery of the many minerals treated. Any Denver "Sub-A" Flotation Cell, singly or in a bank, may be used as a rougher, cleaner, re-cleaner, or even as a conditioner, giving selective high-grade concentrate with low tailing.

COARSE MATERIAL (up to ¼") may be fed from any quadrant, with no short circuiting of pulp. Accurate pulp level is easily maintained. Middlings are recirculated by gravity without use of pumps. Air and/or gas can be admitted under positive control to any Denver "Sub-A" Flotation cell.



PRINCIPAL ORE MINERALS, recovered at this American Zinc Custom Mill by Denver "Sub-A" Flotation, cover a wide range and may vary considerably from hour to hour. These include:

GALENA	GRAY COPPER (copper, arsenic and antimony sulfides usually containing silver).
SPHALERITE	
CHALCOPYRITE	
MARMATITE ($ZnFeS$)	GOLD AND SILVER BEARING PYRITES.
ENARGITE (Cu_3AsS_4)	COMPLEX BASE METAL SULFIDES.

You may read the complete story of this custom milling operation in Deco Bulletin M4-B51. Write for your free copy.

"The firm that makes its friends happier, healthier and wealthier"

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CEMENT—LIME—ORES

F. L. SMIDTH & CO. Manufacture the Following Complete Line of Modern Machinery for Cement, Lime and Allied Materials, the Sintering of Ores, etc.

UNIDAN multi - compartment grinding mill.

UNIKOM multi - compartment grinding mill.

KOMINUTER for wet and dry grinding.

BALLMILL for granulating.

TUBEMILL for wet and dry pulverizing.

TRIX for grading wet granulated material.

TIRAX MILL for drying and grinding.

ATOX, air swept, vertical shaft pulverizer.

PYRATOR for drying and grinding.

SPRAY CASINGS for pulverizers.

CYLPEBS metallic grinding bodies.

DRAGPEB metal lining for pulverizers.

SILEX flint liners for pulverizers.

AIR SEPARATORS and Cyclones.

AGITATORS for mixing and storing wet mix.

AIR DISTRIBUTORS for slurry tanks.

WASHMILL for disintegrating and mixing materials in water.

ROTARY KILNS for cement, lime, ores, etc.

UNAX KILNS, with integral cooler.

SUCTION GRATE ROTARY KILN.

ROTARY KILNS—Sintering and roasting.

PRE-HEATERS for rotary kilns.

UNAX COOLERS, cooling drums on kiln.

UNAX GRATE COOLER, air quenching.

UNAX PRE-COOLER.

F.L.S. MULTI-TUBE ROTARY COOLER.

F.L.S. INCLINED GRATE COOLER.

COOLERS, Cement Ores, etc.

CHAIN SYSTEM for wet kilns.

HEAT EXCHANGERS for dry kilns.

KILN CONTROL, electrical.

GAS ANALYZER, electrical.

KILN EQUIPMENT, fans, hoods, dampers, spouts, airseals, dust chambers, multiple gas discharge.

FLUXO PACKER for filling bags.

EXBINER for discharging bulk cement.

EXTRACTORS, cement from silos.

SKIPULTER shaker conveyor.

CYLCUP distributing conveyor.

PNEUMATIC FEEDERS.

SLURRY FEEDERS for kilns and mills.

CRADLE FEEDERS for coal, rock, clinker.

TABLE FEEDERS for coal, rock, clinker.

COAL FEEDERS for rotary kilns.

COAL BURNERS for rotary kilns.

GAS BURNERS for rotary kilns.

OIL BURNING EQUIPMENT for kilns.

SYMETRO Drive, speed reduction units.

PUMPS for heavy liquids as cement slurry.

FLOURMETER for determining micron sizes and finely ground cement, etc.

PLANT ENGINEERING

F. L. Smidth & Co. are also engineer specialists in designing and equipping factories for making Portland cement and other allied materials, having devoted their efforts along these lines for a period of over fifty years.

Their engineering services include all stages of the project from the preliminary investigation of the site and raw material deposits, chemical and physical tests of the raw materials and finished product, to all necessary drawings and specifications for erecting and equipping all departments of the plant, including also the electrical engineering.

This service applies equally well to complete new plants or any special department of a plant — to revisions or conversions of existing plants — making standard Portland cement, slag cements, white cement, or for making special high early strength cements, such as "VELO."

F. L. SMIDTH & CO.

11 WEST 42ND STREET ENGINEERS NEW YORK, N. Y.

"WE HEAR..."

January, 1949

Dollar value of new construction is estimated at $18,750,000,000 for 1949, up 5 percent from 1948. Private construction will hold at $13,750,000,000, almost the same as in 1948. Public construction will rise to $5,000,000,000, up 24 percent. Construction costs are to average an estimated 5 percent above average costs this year. Physical volume of total construction will be the same as in 1948. Volume of private construction will fall about 5 percent below 1948.

* * * * * * * * * * *

More steel was manufactured in 1948 than in any other peacetime year, total production reaching an estimated 88,000,000 tons. This is 3,100,000 tons more than the 1947 output.

* * * * * * * * * * *

Key men in industry are being inducted into the Army through the draft in some cases. A firm must convince the local draft board that the worker is irreplaceable and indispensable, and often the firm must follow through with more than one petition. Despite a cut-back in the draft, some scientists, including engineers who are not classified as "essential workers," also are among those being drafted.

* * * * * * * * * * *

Legislation authorizing the construction of toll highways in New Jersey became law late in October; however, whether any toll road actually will be built and where it will be located is not too definite.

* * * * * * * * * * *

Importance of obeying safety rules and taking proper safety precautions is emphasized again by two recent and fatal accidents. A father of three children was killed in a cement mixer at a Bethlehem, Penn., block plant while cleaning out the mixer just before quitting time. The mixer supposedly had been turned off, but somehow started up again and the man was thrown against the blades. A hasty lunch hour nap cost a 19-year-old youth his life when a driverless 8000-lb. tractor-type hauler lumbered down an incline at a Dallas, Texas, rock quarry and ran over his head. At noon the youth had set the brakes on the heavily loaded machine, and after lunch stretched out to nap on the ground several feet down an incline from the rock hauler. The brakes on the hauler slipped and the machine rolled down the grade.

* * * * * * * * * * *

A snow-melting highway is about to be opened for use in the town of Klamath Falls, Ore. This is the first application of radiant heating principles to a public road. Hot water from an underground spring will be circulated through a network of welded wrought iron pipe laid in the concrete, automatically melting up to 1-in. of snow or 1/10-in. of ice per hr. The highway is 4 lanes wide, 450 ft. long., with an 8 percent grade.

* * * * * * * * * * *

Current acute shortage of domestic steel scrap for the American steel industry will be partially relieved by the importation of 440,000 tons of German steel scrap. Thirty-eight thousand tons have been obtained from scrapping 19 German submarines.

* * * * * * * * * * *

Federal aid highway construction is experiencing its biggest year on record. Dollar volume of federal aid highway work under construction July 31, 1948, amounted to $906,000,000, far exceeding any previous figure.

WE HEAR

Dwelling units to be started in 1949 are estimated at 875,000 compared with about 925,000 for 1948. However, in order to build this many houses in 1949, builders must cut substantially the average cost of the U.S. home, now $8000 exclusive of lot. It will be necessary to build smaller homes on lower-cost land, using some new materials and new methods.

* * * * * * * * * * *

Several proprietary cement waterproofers have appeared on the German market, Highway Research Abstracts reports. One composition requires mixing of chalk, a fatty acid, and hydrochloric acid; after reaction is complete, sodium silicate and hydrated lime are added while stirring until a paste is formed. In another case a proprietary mix of unknown composition is melted with quicklime and then ground; that powder is mixed with quicklime, ephemeron earth, and porcelain clay. Another waterproofing agent is formed by mixing soap, quicklime, and ephemeron earth. A fourth mix contains 9 percent fatty acid, 6 percent hydrated lime, 50 percent sodium silicate (water glass), and water.

* * * * * * * * * * *

Local gray market operators who demand $1.50 per sack for cement recently forced the Frederick Cement Block Co., Horton, Kan., to temporarily suspend operations rather than force property owners to absorb increased costs.

* * * * * * * * * * *

Another long-range project planning report has been produced by the Bureau of Reclamation, this one listing some 250 irrigation and multi-purpose projects. These jobs would require a total investment of $3.89 billion in the fiscal years 1948 through 1954, the bureau estimates. They would include the irrigation of 2,020,000 additional acres of land, and supply supplementary water for 3,610,000 acres already under irrigation.

* * * * * * * * * * *

An Esso Standard Oil Co. plant in Baltimore, Md., will soon begin producing lime soap grease by a continuous process. Lime and fat are fed into a rapid soap cooker at opposite sides and the cooked grease is forced out of a filling pipe. Older processes required pressure cooking for several hours whereas the reaction is now completed in 45 minutes.

* * * * * * * * * * *

A new abrasive for polishing glass is described in a recent patent assigned to Babcock & Wilcox Co., Inc., by Charles L. Norton, Jr. Kaolin is heated to about 2200 deg. F. in the presence of quicklime, cooled, and cut into desired sizes and shapes. Lime acts as a flux and combines with part of the silica in the clay, thus cementing in place the aluminum silicate formed during calcination. The product thus produced is said to polish glass three times as quickly as rouge and produce a better finish.

* * * * * * * * * * *

"It was mutiny" according to the captain of the sand and gravel towboat owned by Nugent Sand Co., Louisville, Ky. Disagreement arose on the steam towboat resulting in coal and gravel being thrown at the captain and his mate, and their being left ashore some 6 miles up the river from Louisville.

* * * * * * * * * * *

As an employer, you cannot refuse to re-employ a worker who left your employment to join the armed forces before the new draft law became effective on June 24. The Labor Department's Bureau of Veterans' Re-employment Rights advises employers that employes who entered the armed forces before enactment of the new Selective Service Act have reinstatement rights under the old draft law.

* * * * * * * * * * *

Approximately 185 tons of agricultural limestone were given away in one day to residents in the Kansas City, Kan., area in a lawn beautification program being sponsored by Feld Chevrolet Co., and The Kansan. Thompson Crushed Rock Co., Turner, supplied the liming material.

THE EDITORS.

ROTARY KILNS

UNAX KILNS
FOR
LIME BURNING

UNAX KILNS
FOR
CEMENT

SINTERING KILNS
FOR ORES, PHOSPHATES, ETC.

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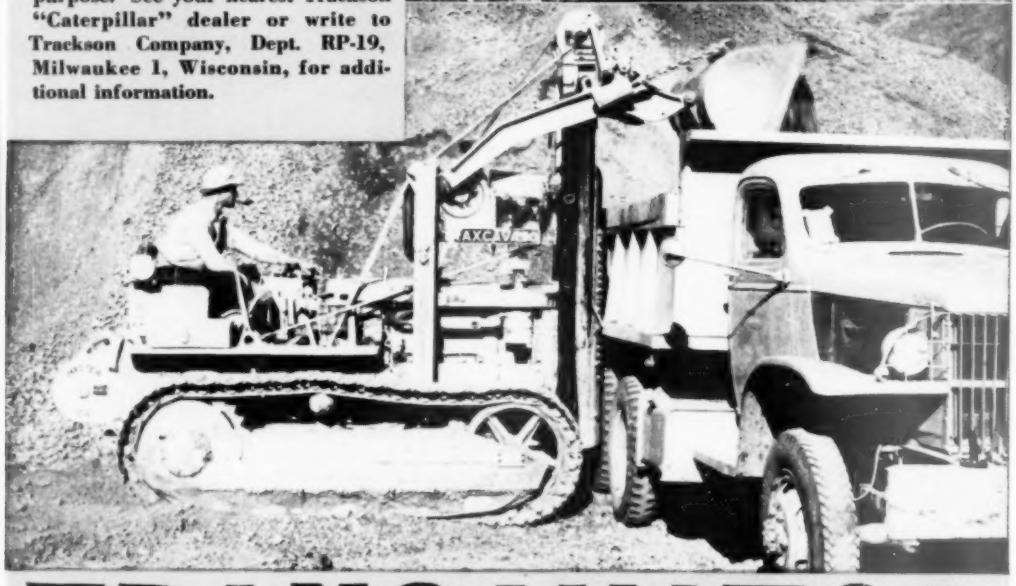
POWERFUL DIGGING... FAST LOADING

CASTRO Valley Rock Company of Niles, California, like many other pit and quarry operators, uses its IT4 TRAXCAVATOR for profitable production of aggregates. (See picture).

Pit and quarry work is tough on machinery but all TRAXCAVATORS from the smallest to largest size have the powerful digging action, fast loading ability, and low cost operation necessary to meet the exacting requirements of the industry. Talk to a TRAXCAVATOR operator—he knows what it means to have the "biting" power and handling ease of a TRAXCAVATOR on any digging and loading job.

TRAXCAVATORS are available in four models, a size for every job and purpose. See your nearest Trackson "Caterpillar" dealer or write to Trackson Company, Dept. RP-19, Milwaukee 1, Wisconsin, for additional information.



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The Original Tractor Excavator

★ ★ ★ Editor's Page

Labor Unions Support Industry on Basing Points

MANY UNIONS are the object of severe criticism, and rightly so, because of the acts of their unscrupulous leaders, their selfish motives and their failure to initiate or support anything that would really benefit the nation and those they supposedly represent.

All labor unions, however, do not fall in that class, and there are those that deserve a lot of credit for their initiative and their sincere efforts to accomplish far more than the levy of dues. They assume some responsibility for the vital interests of their members.

Labor unions can take an interest and be helpful in matters of economic interest to everyone, as well as to themselves, and as voluntary organizations of interested workers instead of labor-union slaves.

They are doing so now in powerful support of industry's opposition to the Federal Trade Commission's ruling that multiple basing-point pricing is now in violation of law as decided by Supreme Court action in the cement case. Clarification of the ruling, sought by many segments of industry, is not enough for labor unions. Those which have gone on record as opposed to the F.T.C. ruling want basing-point pricing legalized, which really is what the heavy-freight industries want and need in order to be positive that their selling practices are legal.

Want Basing Points

Smart and responsible labor leaders know that enforced f.o.b. mill pricing plus total transportation charges to destination, in the establishment of prices for products like portland cement, can prove calamitous to workers. They see ahead to the time when we again will have buyers' markets and they know that localized and very limited marketing areas will be the lot of individual producing plants as they become forced to withdraw into their own little monopolistic territories which the F.T.C. ruling, as it now stands, will have made necessary.

They know that the prosperity of communities that have been built around one or several mills or factories will be jeopardized because these mills depend upon sales far afield in order to maintain high volume production and full employment. Loss in volume of business in many such communities, once the force of competitive selling is set in motion, can be staggering and unemployment widespread. It is further recognized by unions that there will come widespread dislocation and relocation of industry which would necessitate migration of workers from once-thriving communities in order to secure or maintain their jobs. The social implications involved in the breaking up of homes and families are not going unrecognized by responsible labor leaders.

When William Schoenberg, president of the United Cement, Lime and Gypsum Workers International Union (A.F. of L.) appeared before the Senate Trade Policies Committee (Capehart) which has the responsibility to determine the economic effects of the F.T.C. ruling, he urged that early action be taken to clear up the uncertainty that has prevailed since July when the cease and desist order was handed down, requiring that basing-point pricing be stopped.

Fear Labor Migration

Forgetting for the moment all the industries themselves as they are affected, it would seem that early clarifying action by the new Congress is necessary for the protection of the individual worker. As the matter now stands, opinion is that odds are against any legislation on the matter to come from this session of Congress. Representative Patman, one of the chief opponents to change of the F.T.C. ruling, wants Congress to give the ruling a few years' trial before any positive action be considered or taken.

If a clarification is necessary at all, or basing-point pricing should be legalized as the only safe course to follow by industry, early action should by all means be taken. Who knows whether a seller's market will continue a year hence or even three months from now? As pointed out elsewhere in this issue, there are signs now that competition for business is starting. When that happens in affected industries, workers can feel the repercussions very quickly for business will be sensitive to the changeover.

Significantly, Mr. Schoenberg's union, at its national convention in resolving to endeavor attainment of prompt Congressional remedy or relief from the "cement case" ruling, further resolved, " . . . hereby reaffirms our preparedness to *cooperate with representatives of* the cement, lime, gypsum and allied *industries* in matters affecting the welfare of those industries and their employes . . ." Copies of the resolutions, were forwarded to the proper authorities.

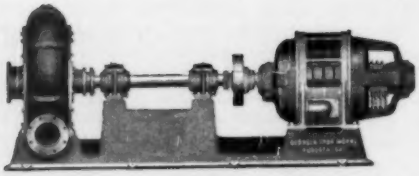
Bror Nordberg

Any way you figure...

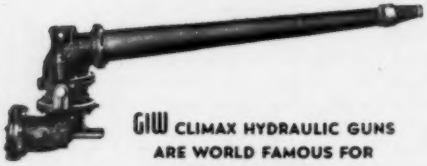
Dependable GIW PUMPS

do the job **Efficiently** *and at* **Lower Cost**

GIW PUMPS Cost Less to Buy, Less to Keep Up, and Less to Operate



RIGHT HAND BOTTOM DISCHARGE SAND AND DREDGE PUMP WITH MOTOR



GIW CLIMAX HYDRAULIC GUNS ARE WORLD FAMOUS FOR MINING AND SLUICING

Let GIW pumps solve the problem of economically moving solids. Here are three reasons why many very successful operators use GIW pumps exclusively:

1. They are so simple that even unskilled labor can operate or assemble them efficiently and easily.

2. Georgia Iron Works makes sand and dredge pumps, hydraulic guns and related parts, and nothing but these items. The rugged dependability of GIW pumps is a matter of record since 1891. GIW parts are made to wear and wear under severe tests. Enjoy the satisfaction of using the tried and true GIW pumps.

3. GIW pumps are the lowest cost pumps of proven quality obtainable. Replacement parts cost much less. Any way you figure, durable GIW pumps do the job efficiently and at lower cost. May we take care of your requirements?

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EST. 1891

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Rocky's NOTES

Nathan C. Rockwood

Crux of Labor Issue Before the 81st Congress

LEADERS OF UNION LABOR seem not to learn much from the enactment of the Taft-Hartley Act, and of various state laws and constitutional amendments which also had and probably still have popular support.

Let's look at the record and recall a little of the history of these two pieces of legislation. The Wagner Act practically compelled union membership in order for one to find employment in any kind of job construed as affecting interstate commerce. With the liberal interpretation given by the National Labor Relations Board and the Federal Courts, this came to include nearly every one in every industry—every one who could be classed as an employe. The law is specific about the "rights of employes," but says nothing about the rights of employers or management.

Under it, numerous labor unions went hog-wild. They asked and collected enormous initiation fees; exorbitant sums for temporary permits for others to work; they compelled independent proprietors in some industries to pay union dues, or be beaten up, or put out of business by boycotts in which they were innocent victims. The leaders in some instances ignored all other law to accomplish their purposes, which were to set themselves up as absolute bosses of their membership. There was no appeal from decisions of a biased group of union officials.

Not infrequently these union officials were not elected by vote of members of their union, but openly and brazenly seized their offices by strong-arm methods; and sometimes they used their offices not to advance the interests of members, but to make undercover deals with unscrupulous employers for lining their own pockets. To be sure there were also many "good" unions, but the fact is that those known to be rotten were associated with and were parts of the same federation or overhead organization as those same "good" unions; and on occasion were defended in public by the general officers. The "good" unions predominated, and they had ample opportunity and authority, backed by public opinion both of their own members and of people generally, to clean house.

Then came various state laws designed to do nothing more than re-assert the state's police powers to protect its citizens in their right to earn an honest living, surely as sacred a right, both constitutional and divine, as any. In several cases the enactment of these laws preceded the meeting of the 80th Congress of the United States. Congress would not have adopted the Taft-Hartley Act over the President's veto had it not been convinced of the rising tide of public indignation, including a host of union members. There was no doubt that some relief from oppressive union bosses was demanded. When public hearings were held before the committees of Congress to try to correct some of these abuses under the Wagner Act, did the leaders of the "good" or of any union offer constructive suggestions? They did not.

What Union Officers Object To

The union spokesmen may now feel cocky because they believe they have elected a federal government that will repeal the Taft-Hartley Act and do their bidding. But "truth crushed to earth will rise again"; if they actually did win the election on that issue, it was won by dishonest representation of the Act as a "slave-labor" law. Of course, they, as well as every other intelligent person familiar with it, and what it has accomplished, know that it is not a "slave-labor law," or comes anywhere as near being such a law as the Wagner Act. It was designed to permit workmen to escape from the clutches of unprincipled labor-union bosses. It is not perfect, and there are legitimate criticisms, but the real reason some union officials want the law repealed is because *it does not compel union membership* and subservience to union bosses.

That is not hearsay. It is evident to any unbiased reader of the arguments before the U. S. Supreme Court, which at this writing is hearing the appeals of A. F. of L. attorneys in the cases of the decisions in the Supreme Courts of the States of North Carolina and Nebraska, which together with a number of other States, have "right to work" laws that prohibit or restrict closed-shop contracts, and in some instances union-shop contracts. These are the parts of the Taft-Hartley Act which make union officials froth at the mouth.

The union attorney's argument before the U. S. Supreme Court for a reversal of the North Carolina Court's decision is quite frankly that "union membership as a condition of employment is indispensable to the right of self-organization and the association of workers into unions." That is the same as saying that "self-organization" of workers can not be accomplished unless membership is compulsory. Indeed, in answer to a question by one of the justices, the attorney for the A. F. of L. said: "All history shows that the unions can't function without the right to refuse to work with nonunion employes."

It is the same as an admission that unions exist only because governments compel membership; that in a country founded to guarantee the individual's divine right to "life, liberty and the pursuit of happiness." Under able and progressive leadership the unions have made and can continue to make many contributions to social progress, but not by attempting to run the U. S. A. for the exclusive benefit of their self-appointed "leaders." For then the Taft-Hartley Act will prove to be only the first attempt to teach union leadership some of the facts of life. In the long run the public always finds ways to protect itself against tyrants, be they Kings, dictators, captains of industry, political bosses, or labor union bosses.

It is encouraging that the government these union leaders take credit for electing has already gently but firmly reminded them that "your unions and all patriotic Americans can be assured of my full support in carrying forward a program for the benefit of all the people of our nation" (said President Truman to the A. F. of L. convention). And the President's special labor relations assistant, John R. Steelman, said to the same group: "The responsibility for the maintenance of a healthy economy rests as much with labor as with any other group. Labor's accomplishments at the bargaining table and in the legislative halls must be measured not only in benefits to the workers, but also in relation to the effect on the economy of the country."

Those are bromides, to be sure, but they deserve constant repetition. Developments do not show that the union leaders who heard these words of wisdom accepted them very seriously, for they immediately announced a program of coercing Congressmen into voting for all legislation they, the union bosses, may consider beneficial to labor. They would do well to remember: "Whom the gods would destroy they first make mad"—(with power).

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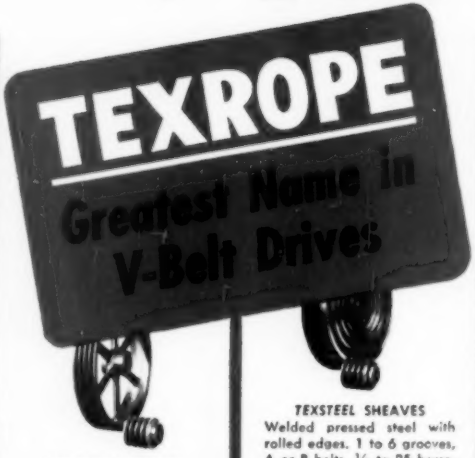

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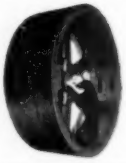

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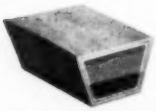

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LABOR RELATIONS TRENDS

The Secondary Boycott Issue

By NATHAN C. ROCKWOOD

WITH REFERENCE to the anticipated repeal of the Taft-Hartley Act, at the urging of labor union officials, we must bear in mind that one of the things in the Act which the A. F. of L. most strenuously objects to is the ban on secondary boycotts. This part of the law eliminated the basis for some of the worst abuses by labor organizations; and producers and manufacturers of building materials know from experience how they were often made the victims of disputes in which they had no part or interest, other than to fulfill their contracts and keep their own employes on the payroll. They were sometimes compelled to pay union dues for employes who were either indifferent or unwilling to join a union, in order that they, themselves, might remain in business.

There seems to be some difference of opinion among newspaper editors and columnists, and radio commentators as to whether or not the unions will be successful in avoidance of this provision of any labor law, but these "authorities" were so wrong on election predictions, we doubt producers or manufacturers will rely much on their present opinions. If these provisions of the law are retained in any form it will be probably only because an aroused public opinion makes itself heard. It would appear, at this writing, that the National Labor Relations Board is not anxious to press secondary boycott cases; which may be because the Board, being a political body, is doubtful of the desirability of the policy in doing so.

A Typical Case

It seems appropriate to refer here to a case typical enough to be familiar to suppliers of all kinds of building materials, because the court's decision contains the salient reasons why prohibition of the secondary boycott should be continued if great injustice to the public as well as to suppliers of building materials is to be prevented. When the issue is before the new 81st Congress, it will be well for producers in this industry to have these facts in mind, for they may want to remind their Congressmen of the justice of their position as determined by a United States Court of Appeals.

The case in question was decided by the U. S. Court of Appeals, 10th Circuit, Denver, Colo., November 2, 1948. Incidentally, this is the same court which decided the two E. C. Schroeder Co. cases, referred to on this page in our December and earlier issues. The appeal was by the United Brotherhood of Carpenters and Joiners of America, Kansas City, Mo., against a decision by a Federal District Court, which granted an injunction under the Taft-Hartley Act at the request of the general counsel of the National Labor Relations Board. It will be recalled that the general counsel acts on his own initiative in such instances, and the courts, on sufficient evidence of violation of the law, are required to issue temporary injunctions pending final action by the N.L.R.B.

In this case the lower court granted the injunction, the Court of Appeals sustained it, but up to this writing (Dec. 7) nearly a year has passed and the N.L.R.B. has taken no action, which leads to the belief expressed above, that maybe it is dodging the issue for the time being at least. It may be recalled that the enmity of the labor-union officers, as publicized in the newspapers, is directed toward the general counsel of the N.L.R.B., and not toward the Board itself, which has always been more pro-labor than otherwise.

The facts in the case are simply and quickly stated. The Wadsworth Building Co., Overland Park, Kan., manufactured fabricated housing units, to which the A. F. of L. building trades in all the cities apparently have a great aversion, because these units lessen the amount of on-the-job "wood butchering," and hence save the builder considerable money. Anyhow, this manufacturer was involved in a labor controversy and his plant was struck. Long before the strike, however, he had made a contract with the local building firm of Klassen and Hodgson to supply materials for a group of houses. In the course of the erection of the first unit, the carpenters' union representative appeared on the scene and called off the only union carpenter then at work, even after the building contractor had assured the delegate that he intended to employ none but union men.

A few days later pickets appeared from the Kansas City, Mo., Building Trades Council, who, as is customary on such occasions, prevented or tried to prevent the delivery of any kind of construction materials, until they could "persuade" the contractor to cease doing business with the Wadsworth company. The facts were brought to the attention of the general counsel of the National Labor Relations Board, and, being convinced, he acted according to the requirements of the Taft-Hartley law.

Legal Aspects

Most of the rest of this article consists of quotations from the decision of the Court of Appeals, which said: "It is contended [by the labor union's attorneys] that no competent or creditable evidence was adduced at the trial showing that appellants [union], by threat of reprisal or force or promise of reward, induced or encouraged employes of other companies to refuse in the course of their employment to transport or handle materials for use in the construction of the Klassen houses, with the object and purpose of forcing Klassen to cease doing business with Wadsworth. In the trial of a non-jury case, it is the province of the trial court to observe the witnesses while testifying, to judge their qualifications, to appraise their credibility, to determine the weight to be given to their testimony, to draw reasonable inferences from the facts established, and to resolve that inferences fairly to be drawn from it were sufficient to support the material findings of fact made by the trial court; and they are not plainly erroneous. Therefore they must stand on appeal.

"Next, it is urged with vigor that the Act is limited in scope to practices affecting interstate commerce; that the dealings between Klassen and Wadsworth were essentially intrastate in character; and that the conduct of appellants [union] did not affect interstate commerce in the manner and to the degree necessary to bring it within range of the regulatory power of Congress."

Here let this reporter inject a suggestion to our readers who may be involved in wage and hour lawsuits where there is the question of whether or not employes are engaged in interstate commerce. The Taft-Hartley Act is much broader in its coverage since it specifically refers to employes in industries "affecting" interstate commerce. Yet, invariably in cases like the one cited, the labor union attorneys plead that the employes *are not* under this Act—and in many instances they have done so successfully. They should be made to eat their words by attorneys for producers defending themselves in cases of alleged Wage and Hour Act violations.

In the Wadsworth case, which we are describing here, the court went to some length to show that Congress has "the supreme, plenary, and complete power" to regulate interstate commerce, without restriction or limitation, except that prescribed in the Constitution. Within that congressional power it can safeguard such commerce against substantial burdens or obstructions, no matter from what source they may come. So, the court ruled that even though this was a local construction job, if the tactics indulged in by the Kansas City Building Trades Council were employed generally, the business of the Wadsworth company, which was interstate, would be seriously interfered with.

In the words of the court: "If the practice of establishing secondary boycotts against those doing business with Wadsworth were extended suffi-

(Continued on page 121)

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GENERAL ELECTRIC

the *Personal Side* of the news

Management Conferences

D. S. COLBURN, vice-president of Marquette Cement Manufacturing Co., Chicago, Ill., has been conducting a series of management conferences at

D. S. Colburn

the company's plants in Nashville and Cowan, Tenn.; Cape Girardeau, Mo.; Oglesby, Ill.; and Des Moines, Iowa. These meetings are held regularly to discuss company growth, policy and local plans for future development. A question and answer period concludes each session. Other department heads will participate in succeeding conferences of this series.

Director of Research

HUBERT WOODS, research director of the Riverside Cement Co., Los Angeles, Calif., has been appointed director of research for the Portland Cement Association, Chicago, Ill. He succeeds HARRISON F. GONNERMAN who has been advanced to the position of assistant to Dr. A. Allan Bates, vice-president for research and development. Mr. Gonnerman fills the vacancy created by the retirement from active service of F. R. MCMILLAN.

Mr. Woods joined the Riverside Cement Co. in 1923 and two years later was made chemical engineer, organizing its research department the following year. He has been research director since 1926, and in 1934 assumed the additional duties of chief chemist. He is the author of various technical papers on cement and cement manufacture. Two of his articles were published in ROCK PRODUCTS, one in February, 1942, and the other in August, 1945. Mr. Woods is a past chairman and now a member of two subcommittees of the General Technical Committee of the P.C.A., and a member of its advisory Committee of the Long Time Study of Cement Performance in Concrete. He graduated from California Institute of Technology in 1923 with a Bachelor of Science degree in chemical engineering.

Mr. Gonnerman joined the Association staff in 1922 as an associate engineer, and served as manager of the research laboratory from 1927 to 1947 when he was appointed director of research. Prior to joining the Association, Mr. Gonnerman held several teaching and research positions at the University of Illinois and had engaged in private business in Los Angeles. He has twice received the Wason Medal of the American Concrete Institute for noteworthy research, and is past-president and a member of the board of directors. He has written many papers, books, bulletins and pamphlets relating to concrete, and holds a Bachelor of Science degree in Civil Engineering and a Master of Science degree from the University of Illinois.

Mr. McMillan has been with the Association for 24 years, joining as an associate engineer in 1924. He was appointed manager of the structural bureau in 1926, director of research in 1927, and assistant to the vice-president for research and development in 1947. He holds a civil engineering degree from the University of Minnesota, is a past-president of the American Concrete Institute, and is the author of numerous papers on cement and concrete research.

Hubert Woods

Executive Secretary

W. VERNON BRUMBAUGH, formerly secretary of the National Lime Association, has been appointed executive secretary of the Refrigeration Equip-

W. Vernon Brumbaugh

ment Manufacturers' Association, Washington, D. C. The Association is the largest in the refrigeration industry with 118 active companies as members. It was organized in 1935, and until recently has been headquartered in Pittsburgh. Mr. Brumbaugh is a veteran in the trade association field, having had 22 years previous experience with national associations including The Waxed Paper Institute, Inc., and American Washer and Iron Manufacturers Association, both of Chicago. Mr. Brumbaugh is a past president of the Washington Trade Association Executives and a member of the American Trade Association Executives and the Trade Association Executives Forum of Chicago.

Other members of the staff are George E. Mills, public relations director, and Harry Fouts, head of the R.E.M.A. statistical and credit department. Mrs. Roma M. Turpen, formerly secretary of the National Lime Association, also has joined the staff of R.E.M.A. in the capacity of office manager.

Executive Chairman

ALBERT M. ANDREAS, formerly president of the Northwest Linseed Co., Minneapolis, Minn., which was sold in 1947, has been elected chairman of the executive committee and a director of the North American Cement Co., New York, N. Y. Mr. Andreas recently purchased a controlling interest in the cement company.

P.C.A. Chairman

WALTER C. RUSSELL, president of the Peerless Cement Corp., Detroit, Mich., has been elected chairman of the board of directors of the Portland

Walter C. Russell

Cement Association, Chicago, Ill. He succeeds Joseph S. Young, president of Lehigh Portland Cement Co., Allentown, Penn., who has served as chairman for the past two years. Mr. Russell has long been active in the affairs of the Association. As a member of the special committee on building facilities, he has taken a prominent part in planning the new research laboratory now under construction near Chicago. He holds a Bachelor of Science degree in civil engineering from the University of Michigan. Mr. Russell became vice-president of the Peerless Cement Corp. in 1933, and served in that capacity until he was elected president in 1942. During World War II he was a member of the Cement Industry Advisory Committee of the War Production Board. He is an active member of the American Society of Civil Engineers.

Receives Research Award

FRANK H. JACKSON, vice-president, American Concrete Institute, Detroit, Mich., and PROFESSOR CHARLES H. SCHOLER, a member of the faculty of Kansas State College, have been presented the Distinguished Service Award of the Highway Research Board for outstanding achievement in the field of highway research.

Mr. Jackson has been actively engaged on highway research for 43 years. Following studies at Ohio State University, he joined the staff of the U. S. Office of Public Roads and its successors, the Bureau of Public Roads and Public Roads Administration. He is a member of the Department of Materials and Construction of the Highway Research Board, the American Society for Testing Materials, American Association of State Highway Officials, a former director and now vice-president of the American Concrete Institute.

Prof. Scholer has earned recognition in the field of highway research as an educator, engineer and scientist. He is chairman of the Department of Materials and Construction of the Highway Research Board. He is an active member of the American Society of Civil Engineers, American Society for Engineering Education, Kansas Engineering Society, American Society for Testing Materials, and Highway Research Board, and is a director of the American Concrete Institute and National Society of Professional Engineers.

Technical Director

CHARLES E. WUERPEL, former chief of the Concrete Research Division of the Corps of Engineers, U. S. Army, has been appointed technical director on the executive staff of Marquette Cement Manufacturing Co., Chicago, Ill. Mr. Wuerpel is a well known authority on the use of concrete, with 24 years of experience in the construction field. After attending Tulane University School of Civil Engineering he joined the Corps of Engineers, where he planned and executed major research projects dealing with the development and use of concrete. He has written many reports and articles on the subject and lectured on concrete technology at the U. S. Military Academy, Harvard and New York universities and at Kansas State College. Mr. Wuerpel recently returned from Argentina where the Province of Buenos Aires awarded him its Medal for Distinguished Service in technology for scientific work there last year. He is a member of the American Society for Testing Materials and of the American Concrete Institute, which awarded him the Wason Medal for noteworthy research for the year 1946.

Charles E. Wuerpel

Carney Official Resigns

N. A. HOLMER has resigned as vice-president in charge of sales for the Carney Co., Inc., Mankato, Minn., to become a partner in the new Smith-

N. A. Holmer

Holmer Co., a manufacturers' sales organization handling building materials for the light construction industry. Mr. Holmer became associated with the Carney Co. in 1944. Previously he was head of sales for Unity Mills Distributing Co., general sales manager of the Mid-State Steel and Wire Co., and director of sales and marketing for the Elastic Stop Nut Corp. Mr. Holmer is president of the Industrial Mineral Institute and a member of the board of directors of the National Mineral Wool Association.

European Traveler

GORDON H. CHAMBERS, vice-president of Foote Mineral Co., Philadelphia, Penn., has returned from an extended sales and research trip to Scandinavia and Western Europe where he contacted manufacturers and processors of lithium and other specialty minerals. While his primary interest was sales, he also investigated all technical advancements developed since the war.

District Sales Manager

CHARLES L. PEYTON has been appointed sales manager for the Illinois-Wisconsin district of the Universal Atlas Cement Co., Chicago, Ill., with headquarters in the Chicago office. Mr. Peyton has had 36 years of sales experience in the cement industry, the last 13 of which he served as sales representative in the district over which he now becomes sales manager.

Asphalt Institute Elections

N. H. ANGELL of The Standard Oil Co. of California, San Francisco, has been elected president and chairman of the executive committee of The Asphalt Institute, New York, N. Y. Five divisional vice-presidents were also elected: Division 1, Atlantic-Gulf, Sidney Goldin, Shell Oil Co., Inc., New York; Division II, Ohio-Great Lakes, D. H. Jenks, Jr., Ashland Oil and Refining Co., Ashland, Ky.; Division III, Midwest, D. E. Scholer, Shell Oil Co., Inc., St. Louis, Mo.; Division IV, Southwest, O. D. Bridges, Houston, Texas; Division V, Pacific Coast, W. L. Spencer, Union Oil Co. of Calif., Los Angeles. Bernard E. Gray was reelected general manager and chief engineer, and Herbert Spencer, secretary. George R. Christie, Socony-Vacuum Oil Co., Inc., was elected treasurer, and John N. Smith, also of Socony-Vacuum Oil Co., assistant treasurer.

Sales Manager Retires

DAVID S. DAY, sales manager of the Duluth, Minn., office of the Universal Atlas Cement Co., New York, N. Y., has retired after 41 years of continuous service. Mr. Day joined the company as a salesman at Minneapolis in 1907, transferring to Pittsburgh in 1908 and to Chicago in 1910. Two years later he returned to Minneapolis where he became office manager. In 1918, he was advanced to assistant Northwestern sales manager and in 1935 was appointed sales manager of the Minneapolis office. Since 1947, he has been sales manager of the Duluth office. Mr. Day is a member of the Universal Atlas "Class of 1907," a group of pioneer cement men who helped introduce cement and concrete to the cities and farms of the Midwest and Northwestern regions when cement was a rare new building material.

Vice-President Resigns

C. R. CADY has resigned as vice-president of the Concrete Masonry Manufacturers Association of Southern California. WILLIAM A. GRINDLE of the San Joaquin Blocklite Co., Selma, Calif., has been appointed for the balance of the term.

Named Vice-President

J. G. WEST has been appointed vice-president and manager of the Indiana Division of Lone Star Cement Corp., New York, N. Y., succeeding GEORGE E. PIERSON, who will remain with the corporation in an advisory capacity.

History of Cement

K. B. LUCAS of North Platte, Neb., a representative of the National Association of Cement Manufacturers, at a recent meeting of the Lions Club of Scottsbluff, Neb., showed some of the nations most outstanding high-speed, super-highways in a motion picture film produced by the Association. Included in the pictures were the Pennsylvania turnpike from Harrisburg to Pittsburgh, the Maine parkway, and the Merritt parkway from Connecticut along Long Island Sound to New York City.

OBITUARIES

HAROLD B. SENIOR, president of the Senior Sand and Gravel Co., Bethal, Conn., died December 5. He was 62 years old. Mr. Senior also was president of the H. B. Senior Lumber Co., treasurer and past president of the Connecticut Lumber Dealers Association and a director of the Northeastern Lumbermen's Association.

FRENCH C. CLINGAN, former manager of the Hartford Stone and Sand Co., Hartford, Ohio, passed away November 18 in St. Petersburg, Fla. He had undergone an operation November 12. Mr. Clingan was associated with the Trumbull Oil Co., which he helped to organize, until his retirement several years ago.

RALPH D. RADER, manager of the Portland Cement Information Bureau, San Francisco, Calif., passed away November 12.

LOUIS HENRY SIMS, an officer of the Southeast Ready Mixed Concrete Co., Salt Lake City, Utah, a subsidiary of the Sims Sand and Gravel Co., died recently at the age of 75. Mr. Sims had resided in Monrovia, Calif., for the past seven years, returning to Holladay, Utah, seven months ago.

COLUMBUS L. DEAL, who had operated Deals lime plant at Gainesville, Ga., died December 4 at his home in Atlanta, Ga., after a long illness. He was 96 years old.

HENRY E. BILLMAN, former president of the Rock Hill Quarries, St. Louis, Mo., died December 9 at Wichita, Kansas. He was 65 years of age.

ALBERT FILLMORE HYDE, founder and chairman of the board of the Consolidated Quarries Corp., Lithonia, Ga., died November 18 at his home in Chappaqua, N. Y. He was 86 years old.

JOHN S. GALT, owner of the Keystone Trap Rock Co., Glenmore, Penn., passed away November 11 at a private convalescent home at Westchester, Penn., after a long illness. He was 67 years of age.

JOHN HENRY AGEE, secretary-treasurer and sales manager of the Oliver King Sand and Lime Co., Knoxville, Tenn., died recently at the age of 60. Mr. Agee, a son-in-law of Oliver King, had been connected with the company for 30 years.

GEORGE W. SHORES, engineer in charge of the crusher sales section of Allis-Chalmers Manufacturing Co., Milwaukee, Wis., died suddenly November 29 while in Oslo, Norway, on company business. He was 55 years old.

HOWARD H. LEH, vice-president and general operating manager at the Bath, Penn., plant of Keystone Portland Cement Co., Philadelphia, Penn., died suddenly on December 5. He was 59 years of age. Mr. Leh had been manager of the Bath plant since 1929 and was promoted to the vice-presidency in 1944. He was previously associated with Phoenix Portland Cement Co., now the Lone Star Cement Corp., Nazareth, Penn., also with Lehigh Portland Cement Company's plant in Mason City, Iowa; Cowell Portland Cement Co., Cowell, Calif.; Old Mission Cement Co., San Juan, Calif., and the Utah Portland Cement Co., Salt Lake City, Utah. Mr. Leh had been connected with the cement industry for 41 years, starting with the Penn-Allen Cement Co., now the Penn-Dixie Cement Corp. in 1907. He served as a chemical engineer, consulting engineer and general superintendent at various times, and also designed and supervised the construction of several cement and lime plants.

FREDERICK G. COTTRELL, inventor of the Cottrell electrical dust precipitator used in the cement industry, died of a heart attack November 16 while attending a business session of the National Academy of Sciences at Lewis Hall, University of California, Berkeley, Calif. Born in Oakland, Calif., Dr. Cottrell graduated from the University of California in 1896 and took postgraduate work in chemistry at the Universities of Berlin and Leipzig. From 1902 to 1911 he was instructor and assistant professor of chemistry at the University of California. From 1911 to 1920 he was with the U. S. Bureau of Mines, becoming director in 1920. From 1922 to 1930 he was director of the fixed nitrogen research laboratory of the U. S. Department of Agriculture.

It was while teaching at the University of California that Dr. Cottrell invented and patented the Cottrell electrical precipitator and with his associates founded the Western Precipitation Co. Desiring to use the proceeds from his invention for the assistance of other scientists in educational and scientific institutions, he organized the Research Corp. of New York in 1912 and gave to it the patent rights on his system of electrical precipitation, reserving only a small part for his associates in Western Precipitation Co. These funds were used to help develop the x-ray microscope, the military rocket, and the first cyclotron at the University of California.

In 1935-1938 Dr. Cottrell and others formed Research Associates, Inc., of which he was president, to conduct scientific and social research, and to expedite the introduction of scientific ideas into the national life.

EVEN ON JOBS AS TOUGH AS THESE

Texaco Marfak seals out dirt and moisture . . . reduces maintenance costs. That's why more than 300 million pounds of Marfak have been sold!

BULLDOZE wet, sticky mud . . . churn through desert dust and heat . . . no matter how extreme the conditions, chassis parts get greater protection and last longer when lubricated with *Texaco Marfak*. Maintenance costs are lower!

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In wheel bearings, *Texaco Marfak Heavy Duty* assures similarly *long-lasting* protection and worthwhile reduction in maintenance costs. *Marfak Heavy Duty* also seals out dirt and moisture, seals itself in, and protects against rust. It won't leak onto brakes . . . requires no seasonal re-packing.

OTHER LUBRICANTS FOR FURTHER PROTECTION

Keep Diesel and heavy-duty gasoline engines clean by lubricating with *Texaco Ursa Oil X***. This is a fully detergent and dispersive oil, made to assure trouble-free operation, maximum efficiency, minimum fuel costs.

Protect track rolls from dirt and moisture with *Texaco Track Roll Lubricant*. It seals out contaminants, assures longer bearing life.

Let a Texaco Lubrication Engineer tell you about Texaco's Simplified Lubrication Plan to assure more efficient and economical performance from all your equipment. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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TEXACO Lubricants and Fuels

Tune in . . . TEXACO STAR THEATRE every Wednesday night starring Milton Berle. See newspaper for time and station.

INDUSTRY News

Gravel Firm Given Rebate on Profits Taxes

GIFFORD-HILL AND CO., INC., which conducts 12 sand and gravel operations in East Texas and Louisiana, is entitled to a rebate on all excess profits taxes paid during 1942 and 1943 according to a ruling of the tax court of the United States. Amounts involved were $352,538.06 in 1942 and $18,568.14 in 1943.

The court held that the sand and gravel company expanded its wartime production more than six-fold to help the war effort, and in doing this, used up sand and gravel deposits which could be used during any year, but by depleting them during the war at an accelerated rate, the corporation "unfairly" subjected itself to wartime taxes which it would not have been required to pay at any other time.

In holding that the corporation should not have been required to pay the excess profit taxes, the court ruled as invalid several Treasury Department directives pertaining to mineral properties.

Idaho Phosphate Plant Nears Completion

GEM STATE PHOSPHATE, a plant to produce triple phosphate for members of the Idaho Farm Bureau Federation, is nearing completion at Wendell, Idaho. Equipment has been installed to handle 800 tons of rock per day which will be brought from an 8100-acre tract owned by the Federation and by Gates Brothers Co. Charles T. Gates, manager, said the new plant would supply needs of the 7000 members of the Idaho farm organization.

Vermiculite Plant Opened

BUILDING MATERIALS, INC., manufacturer of vermiculite plaster, has been granted permission to establish a plant at Canon City, Colo., on property formerly occupied by Consolidated Feldspar Co. The new company also will take over some of the feldspar company storage facilities and equipment.

Cement Company Expands

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., has erected three new buildings at its Des Moines, Iowa, plant. One, a sack warehouse, has automatic devices for cleaning cloth sacks, with self-propelled trucks to carry the sacks and stack them. The other new buildings are being used for filling sacks with cement and loading into freight cars. Expansion plans also include construction of a bulk loading station.

Quarry Company Sells Part of Plant

COLUMBIA QUARRY CO., St. Louis, Mo., announces sale of certain parts of the company's land and equipment at Prairie du Rocher, Ill., in an unusual transaction, to Solvay Process Division, Allied Chemical & Dye Corp. Columbia Quarry Co. conveyed 675 acres of stone land and a good portion of the plant, keeping a spare No. 12 and No. 8 crusher, a 1¼-cu. yd. Osgood mining shovel, a 30-B Bucyrus-Erie mining shovel and a number of other surplus items. In addition, the company retained over 1000 acres of stone land.

Purpose of the purchase by Allied Chemical & Dye Corp. is to furnish a plant at Baton Rouge, La., with some 725,000 tons of 8- x 2-in. kiln stone per year. Columbia Quarry Co. retains exclusive sales right on all surplus stone smaller than 2 in. in size. To date, Columbia had been confining sales to minus 2-in. stone.

Employes Sue For Overtime

ELEVEN EMPLOYES of the Colonial Sand and Gravel Co., Inc., Waterbury, Conn., have filed a joint suit in Superior Court charging the company with violation of the overtime pay provision of the federal Fair Labor Standards Act. The plaintifs seek actual damages totalling $57,000, plus an equal amount for liquidated damages as provided by the federal statute. They claim the company, engaged in interstate commerce and thereby governed by the Fair Labor Standards Act, failed to pay time and one-half rates for work in excess of 40 hours, for work weeks betwen March, 1939, and June, 1948.

Buys Controlling Interest in Cement Company

ALBERT M. ANDREAS, Minneapolis, Minn., has purchased controlling interest in the North American Cement Co., New York, N. Y., and has been elected chairman of the executive committee and a director. The cement company has four plants, located at Catskill, N. Y.; Howes Cave, N. Y.; Hagerstown, Md., and Berkley, W. Va.

Takes No Action on Common Dividend

COLONIAL SAND & STONE CO., New York, N. Y., has taken no action on the common dividend. The company had been paying 10c quarterly since April, 1947, the last payment being made October 27, 1948. According to Generoso Pope, president, action of the board reflected necessity for conserving working capital. The company initiated during the past two years a plant expansion program to handle its record backlog of orders. "During this period," Mr. Pope said, "the company through purchases and acquisition of another company, expanded its moving equipment from 192 trucks to 306 owned at present; has opened up an additional seven concrete and general material plants throughout the metropolitan area in order to expedite deliveries and thus give greater service to its customers; and has purchased a garage for the purpose of centralizing all the repair work to its many types of equipment."

Gravel Plant for Dam Project

CONSTRUCTION of a gravel plant at Hungry Horse damsite, Great Falls, Mont., has been started with the pouring of concrete for a 7- x 8-ft. 700-ft. long gravel recovery tunnel. Some 3,500,000 cu. yd. of sand and gravel will be used in the dam. About 10,000 freight carloads of cement will be used in constructing the concrete dam.

Granted Dredging Permit

J. K. DAVISON & BROTHER, Pittsburgh, Penn., has been granted permission by the District Army Engineer's office to dredge sand and gravel in the channel of the Allegheny river in the seventh pool.

Company Changes Name

CARLTON M. ROGERS, president, has announced that the Union Plaster Co., Phoenix, Ariz., has changed its name to Union Gypsum Co.

Opens Gravel Plant

PAT TRENARY, Trenton, Mo., has started gravel crushing operations near Pattonsburg, Mo. Mr. Trenary also operates a quarry in Grundy county, west of Trenton.

Merit Increases Under National Labor Relations Act

NATIONAL INDUSTRIAL SAND ASSOCIATION, in response to a number of letters from member companies advising that some unions are claiming that a recent decision of the National Labor Relations Board compels employers to obtain prior approval of unions before granting merit increases or even before employees can be promoted from a lower grade to a higher grade, has distributed a letter from association counsel Charles A. Horsky, clarifying that the decision of the N.L.R.B. does not have the claimed effect.

The decision does not make it necessary for employers to get the union's approval before an employee is promoted or given a merit increase, except as the employer may bind himself by contract to require such prior approval. This arrangement is not a practice in the industrial sand industry.

According to Mr. Horsky, "The case does not hold that it is always a violation of the N.L.R.B. Act for an employer to give a merit increase. It is no doubt true, and always has been true, that a merit increase, or any other wage increase, might under some circumstances be found to be an attempt to undermine the union, or discredit it, or discredit its negotiating committee, and the like. The rule on that has not been changed by the case. It is no doubt also true that a merit increase might be a violation of a collective bargaining contract, if the contract forbade such increases. But in the absence of a contract, and circumstances which would make a wage increase an interference with the union, a unilateral merit increase may still be made.

Produces Silica Sand

CONCRETE MATERIALS CO., Waterloo, Iowa, is shipping 36 railroad carloads of silica sand per week, with plans to double production in the near future. The project, located only a few yards from the Milwaukee railroad south of Clayton, Iowa, was started as a strip mining enterprise about 20 years ago. Production of silica started a year ago, and since then, 700 carloads have been shipped. Dean Jones is superintendent.

Cover Picture

ILLUSTRATED on the cover are precast concrete structural members being placed in a new building being erected in Pittsburgh, Pa., for Blaw-Knox Manufacturing Co. Longest precast beams being used are the vertical members, which extend the full height of the building, and are 53-ft. long, 16 x 16 in. in diameter. These units weigh 7 tons each.

Precasting large structural members is a relatively new practice in the United States, but offers possibilities for concrete products producers.

Construction of the building pictured on the cover is under contract to the Cemenstone Corp. All beams are cast and handled in a horizontal position, being delivered to the building site by pole trailers.

Gypsum Production

DOMESTIC PRODUCTION of crude gypsum amounted to 1,882,146 short tons in the third quarter of 1948, as reported by producers to Bureau of Mines. Imports of 1,003,220 short tons during this period set an all-time record and nearly doubled the average rate during 1947. Production of 1,667,032 short tons of calcined gypsum was almost one-third greater than for the corresponding period of 1947. A record 443,326 short tons was sold for use as portland cement retarder, and substantial increases were shown in the volume of gypsum lath and plaster sold. Combined sales of wallboard and laminated board were lower than in the previous quarter, however.

Coming Conventions

January 16-20, 1949—
Associated Equipment Distributors, Annual Meeting, Stevens Hotel, Chicago, Ill.

January 18-20, 1949—
National Agricultural Limestone Association, Inc., 4th Annual Meeting, Washington, D. C.

January 20-21, 1949—
Wisconsin Concrete Products Association, 29th Annual Convention, Pfister Hotel, Milwaukee, Wis.

January 27-29, 1949—
Sand-Lime Brick Association, 43rd Annual Convention, Hotel Statler, Detroit, Mich.

Jan. 31-Feb. 3, 1949—
National Concrete Masonry Association, 29th Annual Convention and Concrete Industries Exposition, Cleveland Public Auditorium, Cleveland, Ohio.

February 7-9, 1949—
National Crushed Stone Association, 32nd Annual Convention, Hotel New Yorker, New York, N. Y. There will be no exhibit.

February 13-17, 1949—
American Institute of Mining and Metallurgical Engineers, Annual Meeting, San Francisco, Calif.

February 14-18, 1949—
National Ready Mixed Concrete Association, 19th Annual Convention, Hotel New Yorker, New York, N. Y. There will be no exhibit.

February 14-18, 1949—
National Sand and Gravel Association, 33rd Annual Convention, Hotel New Yorker, New York, N. Y. There will be no exhibit.

February 17-18, 1949—
American Concrete Pipe Association, Annual Meeting, Fresno, Calif.

February 21-22, 1949—
Agricultural Limestone Institute, National Crushed Stone Ass'n., 4th Annual Convention, Edgewater Beach Hotel, Chicago, Ill.

February 22-25, 1949—
American Concrete Institute, 45th Annual Convention, Hotel Pennsylvania, New York, N. Y.

February 23-26, 1949—
American Concrete Institute, 45th Annual Convention, Hotel Statler (Pennsylvania), New York, N. Y.

Feb. 28-March 4, 1949—
American Society for Testing Materials, Spring Meeting and A.S.T.M. Committee Week, Edgewater Beach Hotel, Chicago, Ill.

March 10-13, 1949—
American Concrete Pipe Association, Annual Convention, John Marshall Hotel, Richmond, Va.

Agricultural Limestone Institute Convention

TENTATIVE PLANS have been announced for the 4th annual convention of the Agricultural Limestone Institute which will be held February 21-22 at the Edgewater Beach Hotel, Chicago, Ill. The program will cover production, distribution, and some of the legal problems encountered in the agricultural limestone field. Speakers will include: ALBERT J. LOVELAND, Under Secretary of Agriculture, who will discuss the agricultural situation in Washington with special emphasis on the Agricultural Conservation Program; DR. R. H. BRAY, professor of soil fertility, University of Illinois, who will explain the new concept of elastic soil fertility as it affects limestone use; J. B. TURNER, Illinois farm advisor, who will describe a successful campaign launched in his county which resulted in a substantial increase in agricultural limestone consumption; and W. F. SHARPE, Dillon, Sharpe and Co., who will relate firsthand experiences in promoting agricultural limestone and the use of the Institute's promotional materials. CHARLES A. HORSKY, attorney, will talk on the application of certain Federal laws to agricultural limestone businesses.

The entire afternoon of February 21 will be devoted to a discussion of operating problems. A recent survey of the membership indicated that the following three phases of limestone production have been the most bothersome: blasting, crushing and grinding, and screening moist and dry materials. JULES C. JENKINS, Vibration Measurement Engineers, will lead the discussion and report on recent observations on delayed action blasting. E. LEE HEIDENREICH, JR., consulting engineer, will cover crushing and grinding, and C. E. HOGEBOOM, Consumers Co., and JOE C. LAWRENCE, Liberty Limestone Corp., will talk on screening. A question and answer period will follow.

Lighter aspects of the convention include two luncheons and a cocktail party and buffet supper with music.

A.I.M.E. Annual Meeting

THE ANNUAL MEETING of the American Institute of Mining and Metallurgical Engineers will be held February 13-17 at the Fairmont Hotel, San Francisco, Calif. WM. WALLACE MEIN, JR., chairman of the San Francisco section of A.I.M.E. for 1948-49, and in charge of general arrangements for the annual meeting, represents the non-metallic industries on the California State Mining Board, and has arranged for several papers on non-metallics including: "Alkali-aggregate Reaction" by ROBERT F. BLANKS and DR. ALLAN BATES; "Fuel Economy in Cement Manufacture" by ROBERT A. KINZIE, JR.; and papers on mining, quarrying and processing limestone, aggregates, and other non-metallics. This is the second annual meeting to be held outside New York, N. Y., and is timed to coincide with the Centennial celebration of the California gold rush of '49.

Technical sessions and luncheons will be held for all divisions of the institute. Proposed field trips include Kettleman Hills and the Rio Vista Gas Field, Grass Valley and Yuba gold fields, the Permanente cement plant, and a post-convention tour to Hawaii.

Sand and Gravel, Ready Mix Conventions

TENTATIVE PLANS for the forthcoming National Sand and Gravel Association and National Ready Mixed Concrete Association annual conventions, to be held February 14-18 at the Hotel New Yorker, New York City, have been announced by VINCENT P. AHEARN, executive secretary.

Members of the N.S.G.A. board of directors will meet on Monday morning, February 14, and the N.R.M.C.A. board will meet in the afternoon following a joint luncheon of both boards. The N.S.G.A. taxation committee, J. RUTLEDGE HILL, chairman, also will meet the same afternoon. The evening will be devoted to an informal N.S.G.A. and N.R.M.C.A. open forum on problems of labor relations in the two industries. This will be led by CHARLES A. HORSKY, R. E. TOBIN, and Mr. Ahearn. Topics to be covered include: the Taft-Hartley Act, execution of labor agreements, and computation of overtime pay under the Bay Ridge Case. Mr. Tobin will present examples of computation through the medium of slides. State and district association officials in both industries have also scheduled a luncheon for this day.

Both conventions will be opened officially on the morning of February 15 with addresses by both presidents, and reports of the director of engineering and executive secretary. N.S.G.A. and N.R.M.C.A. safety trophies will be awarded, after which ROBERT MITCHELL, Los Angeles, Calif., will discuss the safety program of Consolidated Rock Products Co., giving emphasis to public relations and good employe relations.

N.S.G.A. will hold a separate session in the afternoon. Discussion will cover the use of sand and gravel in bituminous construction, and an open forum on operating problems will be held.

A separate session of the cost accountants of the industries, and the annual meeting of the Manufacturers' Division of N.S.G.A. also are scheduled for the same day. In the evening, STANTON WALKER, assisted by his associates FRED BARTEL and DELMAR BLOEM, will conduct an informal session on the design of concrete mixtures including adjustments for entrained air.

N.R.M.C.A. will hold a separate session on the morning of February 16. Topics to be covered include a paper on lightweight concrete. Discussion will be led by EUGENE SUNDT, Albuquerque Gravel Products Co. There will be a talk on sampling and testing ready mixed concrete describing the work of an association committee and recommended practices for such procedures. DELMAR BLOEM will report on an N.R.M.C.A. laboratory project after which an open forum on operating problems in the ready-mixed concrete industry will be conducted.

A joint meeting of both associations will be held in the afternoon featuring the following four speakers and topics: G. DONALD KENNEDY, vice-president, Automotive Safety Foundation, on "Federal Highway Legislation"; B. D. TALLAMY, commissioner, New York Department of Public Works, on "The New York State Highway Program"; THOMAS S. HOLDEN, president, F. W. Dodge Corp., on "Construction Industry Prospects for 1949"; and General RAYMOND A. WHEELER, chief, Corps of Engineers, U. S. Department of the Army, on the construction program of the Corps of Engineers. On this day, there will also be an open meeting of the N.S.G.A. committee on zoning, land rehabilitation and stream pollution, WM. EDWARD HOLE, chairman.

Separate and concluding session of N.S.G.A. will take place on the morning of February 17, when J. R. GILBERT, Corps of Engineers, will discuss "War Department Specifications for Aggregates." The committee on taxation will present a progress report; and FRED BARTEL, will report on a current N.S.G.A. laboratory project, after which election of officers will be held.

Both organizations will attend luncheon together at which ROBERT MITCHELL will be toastmaster. M. W. CLEMENT, president, Pennsylvania Railroad Co., will speak.

N.R.M.C.A. will hold its closing session in the afternoon. W. D. M. ALLAN, director of promotion, Portland Cement Association, will discuss "Markets for Ready Mixed Concrete in 1949"; Mr. Horsky will discuss the basing point and delivered pricing problems raised in the cement case; and Mr. Ahearn will report on "Cement Supply in 1949." After an open forum on merchandising problems, presided over by ROBERT COLLINS of Philadelphia, election of officers will be held.

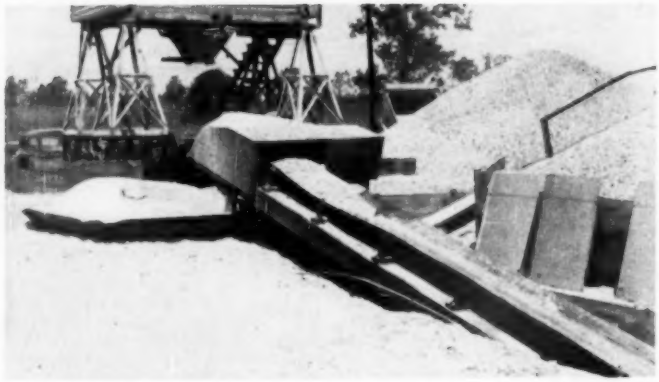
(Further convention reports on page 118)

Granite Co. Sold

PIKE RIVER GRANITE CO., Marinette, Wis., has been purchased by Murphy Granite Co., Green Bay, Wis., at a sale price said to be close to $27,000.

HINTS and HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN



Low ground hopper, left, receives aggregates from rail hopper belt conveyor, trucks or storage-area clamshell

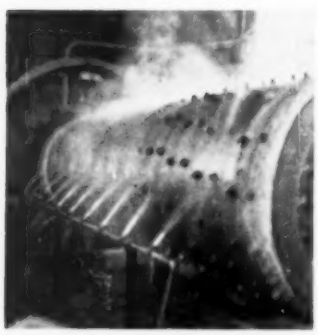
Triple-Purpose Hopper

THE INCLINED BELT in the illustration delivers aggregates from a rail hopper to a low ground hopper (left). The top of the ground hopper is only a few inches above ground level and feeds the main Robins belt conveyor that elevates materials to the overhead bins of Red Ball Concrete Co., Inc., Baton Rouge, La. The low ground hopper can also be filled by trucks dumping to it direct or by a Lorain clamshell unit that the company uses to reclaim aggregates from ground storage. This company operates a fleet of 12 White trucks mounted with 3-cu. yd. Rex mixers.

Cooling Device for Cement Finish Mill

IN THESE DAYS of required high capacity production there is not always ample time to allow cement clinker to cool sufficiently for additional processing. The operator of a western cement plant using an F. L. Smidth Unidan mill for grinding finished cement adapted the old idea of water-spraying the mill to speed output, as shown in the illustration.

There are 10 sprays on the header and each spray requires about two g.p.m. of water. None of the water is near either mill bearing and the only effect noticeable is a small amount of steam coming off the drum. The mill is driven by a 900-hp. GE synchronous motor.



Water-spray arrangement for cooling of finished cement clinker in grinding

Prefabricated steel stacker belt arrangement with motor drive and pulleys located over lower end (right) so as to avoid excess weight at unsupported end. Live storage capacity of this stacker belt is approximately 7000 tons

Stacker Belt

AT A NEW sand and gravel plant, a large, intermediate, storage pile of semi-finished stone is incorporated in the flow. Stacker belt for this surge pile is of prefabricated steel design and is mounted at its lower end on well-designed concrete piers. Drive motor and pulley assembly for the conveyor is mounted over the belt at the lower end so that the additional weight is not a factor as would be the case if the motor were at the discharge point.

The motor drives the return belt pulleys through silent roller chains. All the bearings are Dodge Timkin on this stacker belt installation. The unsupported end of the belt is sufficiently high to give a live storage capacity of about 7000 tons, or enough material to run the plant about 14 or 15 hours.

Motor cover, built in the company shop, affords ample protection from weather for outside motors otherwise unprotected

Motor Cover

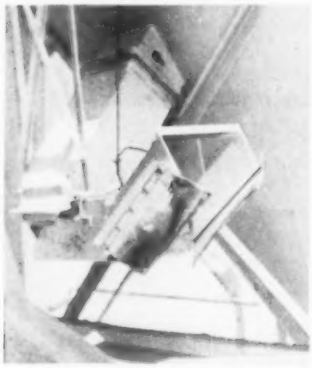
MANY PLANTS in the south and west are built more or less out in the open so that motors have to be protected from the weather. Many times the covering is just a makeshift affair; but one operator used a little care and thought in designing a motor covering. The cover illustrated is a neat metal hood with an air inlet provided at the bottom and a louver at the top for hot air to escape. This effective cover is easily built in most company shops and affords ample protection from weather.

Aggregate Control Gates

AT THE NEW distribution and ready-mixed concrete plant of Pacific Coast Aggregates Co., Oakland, Calif., clamshell gates under aggregate bins are simple and effective. These gates are used quite extensively by the company in several of its other plants. The

take-off chute is enclosed and always full of aggregate. This chute discharges to a hinged apron that is fixed to the chute's lip. By lowering the lip, the flow of material starts and the further it is lowered, the greater the flow. Skirt boards of steel with rubber-belting sections bolted to the frame are a part of the assembly.

A steel cable of small diameter is fixed to the apron by a bridle and the cable extended to the operator's platform near the top of the plant. Here are located all the gate controls for the several bins, the electrical controls, and the shifting device for moving the swiveled spout over the ready-mixed concrete plant bins.



Fully-enclosed take-off chute on clamshell gate under aggregate bin allows remote control and proportioned flow

Handling of Oversize

AT THE NEW plant of Lime Products Co., Clebourne, Texas, kiln rock that is processed as lime producer feed is crushed to minus $1\frac{1}{2}$ in. and sized

Hopper for collection of oversize that is periodically trucked back to the primary crusher for re-processing

Glass house that affords operator and controls full protection from weather, yet affords full view of stockpile area and belt conveyors

over a battery of Pioneer vibrating screens. There is a small amount of plus $1\frac{1}{2}$-in. stone that passes the secondary reduction roll crusher, and here this oversize is chuted to a truck hopper (shown in the illustration). A truck loads under the bin and delivers the stone back to the secondary crusher.

This plant also features a "glass house," for protection of the operator and controls of five belt conveyors serving a stockpiling area. The storage section contains four sizes of stone. Westinghouse push-button controls, augmented by Bulldog Clampmatic contact switches, are arranged within easy reach of the operator—who has full view of all belts and storage piles through the glass sides of the house.

Water Clarification

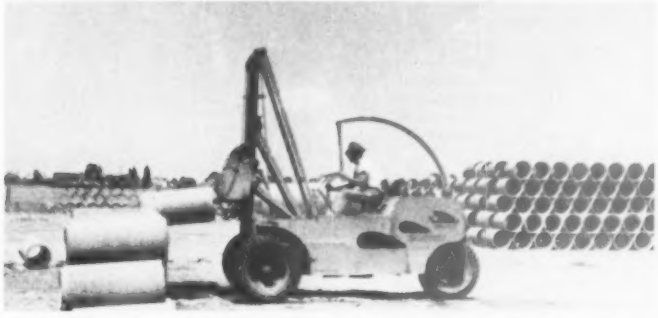
AT THE NEW sand and gravel plant of Griffith Co., near Bakersfield, Calif., wash water is secured as a by-product from the oil fields that surround the area. Prior to its use in the plant, the water has to be purified and cleansed of oil particles. To accomplish this, the operators built a series of shallow settling ponds each about 40 x 60 ft.

Water, containing small amounts of oil waste, enters the upper pond and flows to the second lower pond through a submerged outlet. All floating oil is drained off through a higher outlet. This is repeated through five ponds. The last pond is larger in area, being about 60 x 100 ft. Water going to the wash plant is free from all oil and contamination and can be strained through a white handkerchief without any discoloration. Clear water flows from the last pond by gravity to a sump serving a Byron Jackson centrifugal pump that elevates the water to the plant.

Settling ponds for removing oil waste and contaminants from water prior to its use as wash water in a sand and gravel plant

Fork Truck Handles Concrete Pipe

THE MERCED, CALIF., plant of United Concrete Pipe Co. uses a five-pronged lift truck that can lift five 14-in. dia. concrete pipe at one time. The prongs are adjustable for various diameter pipe. This Scoopmobile is used for yard transport, loading highway trucks or trailers and for stacking pipe in stock.



Fork truck re-stacking concrete pipe for storage. This unit also loads orders on trucks and provides yard transport for as many as five 14-in. dia. pipe at one time

New Machinery

ROCK PRODUCTS

Deep-Well Vertical Pump Motor

U. S. MOTORS announces a new development in deep-well, vertical pump motors known as the Verticlosed

Verticlosed pump motor

Streamway motor. Designed for application to practically all types of turbine pumps, the motor has an interchangeable base to permit increase or decrease in horsepower without the expense of re-machining or exchanging the pump head. A waterproof housing protects vital parts of the motor, and downdraft ventilation prevents re-entry of expelled hot air by blasting the air for approximately five diameters away from the motor. Other features include full visibility of oil supply, thorough flushing out of all de-vitalized grease, gravity-fed oil flow, adjustable hollowshaft, asbestos protection of windings, solid cast aluminum rotor and reverse protection clutch.

Coupling Selector

THE FALK CORP., Milwaukee, Wis., is in production of a new Steelflex coupling selector, intended to be used by engineers and other men instrumental in the selection and purchasing of flexible couplings. The new selector will handle selection of couplings from Falk sizes 3F to 18F on the slide rule principle. Design of the unit is based on horsepower, by application, and by r.p.m. at which the coupling is to travel.

Soil Testing Meter

LIMEMETER LABORATORIES, Columbia, Mo., is manufacturing and distributing a soil testing meter which operates on 60-cycle, 110-volt current. In operating the meter, a calibrated scoop of soil is measured into a cup and mixed with an equal quantity of distilled water. The electrodes of the limemeter, as it is called, are inserted into the mixture, permitting a direct reading of the pH of the soil.

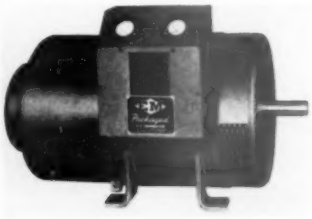
The quantity of ground limestone required by a lime-deficient soil is determined by adding to the mixture of soil and water used above a measured quantity of special lime solution. The soil absorbs calcium, releasing hydrogen, very much as when a soil is limed in the field. The quantity of calcium absorbed by the soil is read from the dial of the limemeter, which is calibrated to read in thousands of pounds of limestone per acre. The lime requirements read from the dial represent the quantity of high-grade, finely-ground limestone required to bring an acre plow depth of soil to pH 7.

Mobile Compressor Unit

WILLYS-OVERLAND MOTORS, INC., Toledo, Ohio, has added the Schramm "Model 105" compressor unit to the list of equipment designed for use with the Universal Jeep and Jeep four-wheel-drive truck. The Model 105 is a four-cylinder, single-stage cycle unit, built for full load continuous service and designed for the center power take-off of the Universal Jeep and truck. Capacity of actual free air delivery of the unit is 105 c.f.m. at 100 lb. gauge pressure. The compressor is bolted to a heavy adjustable base which is rigidly attached to the Jeep frame, and the drive, which transmits power from the Jeep engine to operate the unit, is completely enclosed for protection of the operator.

Increases Line of Squirrel Cage Motors

ELECTRIC MACHINERY MANUFACTURING CO., Minneapolis 13, Minn., announces a new line of extra-low



Low starting kv.a. induction motor

starting kv. a. squirrel cage induction motors called Design X. The new line is available in flange-mounted type and coupled, two-bearing type for direct coupling to 514, 600 and 720 r.p.m. air compressors. The line permits full-voltage starting (across-the-line) with a starting kv.a. of 425 percent, compared with 550 percent starting kv. a. of the Design B motor.

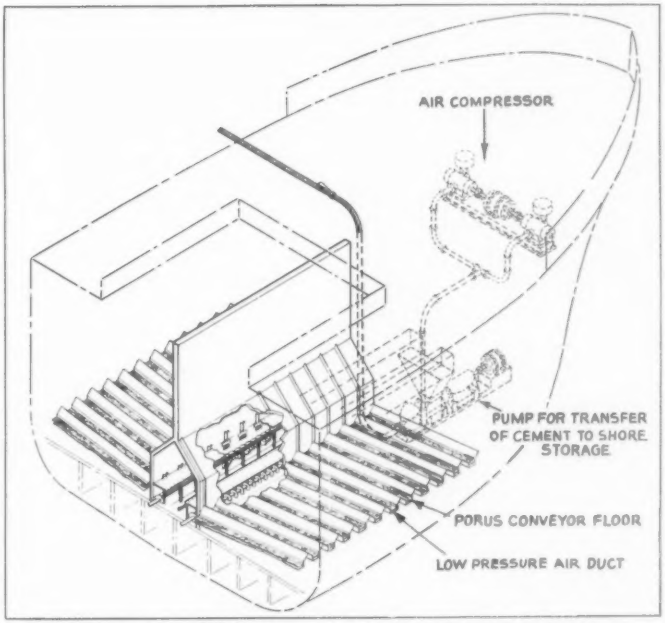
Air hammer is operated by compressor unit mounted on Jeep four-wheel drive truck. The unit derives its power from the Jeep engine through the center power take-off of the vehicle

Air-Activated Conveyor

FULLER Co., Catasauqua, Penn., announces development of the F-H Airslide, a conveyor for transporting fine, dry materials without the use of moving parts. Bottom of the conveyor is comprised of a porous medium over which a stream of material flows by gravity due to air that passes through the medium to fluidize the material being conveyed.

The medium used is of low-air permeability, making for uniform distribution at low air pressure (e.g., 6-in. W.G.). This type of conveyor has been successfully used to convey such materials as gypsum, soda ash, barite, bentonite, lime, cement and fly-ash; and has been designed for use in plants or carriers such as bulk trucks or ships. It is claimed that low bins in places where head-room is limited can be made self-emptying by the addition of Airslide withdrawal conveyors.

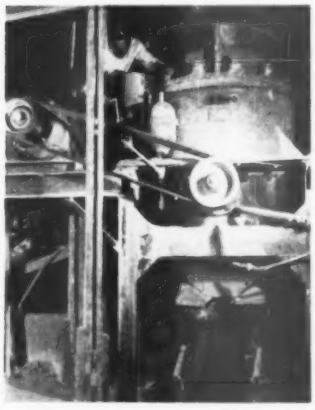
Advantages claimed for this conveyor are ease of installation, low power consumption, and dustless and noiseless operation. It can be directed around obstructions and is low in maintenance cost. In a single cement plant installation these conveyors are stated to convey 40,000 t.p.d.



Diagrammatic plan of air-activated conveyor system in hold of bulk cement-carrying ship to speed unloading and yield maximum amount of cargo space

Increases Line of Equipment

ALLIS-CHALMERS MANUFACTURING Co., Milwaukee, Wis., has revealed that a number of new developments have been incorporated into the company's line of equipment for 1949. Included is completion of design work on a new line of primary and secondary crushers, new Type "R" crusher sizes and re-designed A-1 jaw crusher features for greater ease in re-placing worn parts. The primary and secondary crushers feature a hydraulic head support; and a new standard size (84 in.) will be available in the Type "R" line, plus several other new sizes down to 48 in.



Reduction crusher reduces ⅝- to 1½-in. feed

Utah electromagnetic vibrating screens have been divided and modified to permit removal of sand as well as pieces of coke; and an 11- x 121-ft. Lepol process portland cement kiln with related nodulizer and Lepol grates is being manufactured. Other screen developments include a longitudinally-crowned, flat-transverse bolted deck for simplified removal of worn screen sections, and a perforated plate covered by a protecting cloth for increased life where the screen is used to drain and wash the media from iron and similar ore as it leaves heavy media separatory vessels.

Other developments, as reported by the company, include small motors ranging from ½ to 7½ hp. for driving fans, compressors, etc. These are available on N.E.M.A. frame sizes 203 to 284 inclusive, in totally enclosed, non-ventilated and totally-enclosed, fan-cooled models, in both standard and explosion-proof types. The motors feature ribbed-yoke construction for easier cleaning, die-cast aluminum rotors and prelubricated sealed bearings.

A new Texrope sheave offers motion control in the wide-range Vari-Pitch type of V-belt sheave, the manufacturer reports. Used with an ordinary sheave and a Texslide motor base, the new sheave permits speed adjustment up to a 2:1 ratio while the drive is in motion. In the power distribution equipment division, a reduction up to 15 percent in dimensions and weights of some power transformers in the 750-10,000 kv.a. range, 66 kv. and below have been announced. A new line of low voltage (600 v) current transformers also was developed which, according to tests, show ability to maintain accuracy at 60 percent overload without overheating.

Automatic Line Oiler

GARDNER-DENVER Co., Quincy, Ill., has announced a new line oiler that protects against running rock drills or other air-actuated equipment without adequate lubrication. Known as the LO12 Automatic Line Oiler, the device shuts off the line air automatically when all the oil in the reservoir has been used. Flow of oil is metered so that any pneumatic equipment using from 25 to 500 cu. ft. of air per minute can be efficiently lubricated, the company states. Capacity of the line oiler is one pint, and it is not necessary to shut off line air or stop the machine to which it is attached in order to refill the reservoir.

Automatic line oiler

Double-Duty Eye Sweep

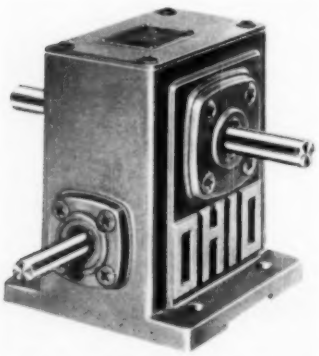
GENERAL SCIENTIFIC EQUIPMENT Co., Philadelphia, Penn., announces its new Eye Sweep, a handy first-aid

Eye sweep with flexible loop at one end for removing cinders, and magnet at other end for removing metal fragments

unit for use especially where workers are exposed to flying metallic fragments or other foreign metal substances subject to magnetic attraction. One end of the instrument is fitted with a magnet for removing steel splinters, while the other is fitted with a flexible loop for removing cinders, dust and other particles. Sterilization of the instrument does not diminish magnetic qualities or affect the loop. Each unit is provided with a hard-rubber carrying case.

Small Size Speed Reducer

OHIO GEAR Co., Cleveland, Ohio, is manufacturing a new single reduction speed reducer in the "baby" size. The new unit, designated as BHS, is



Small sized single-reduction speed reducer

a right-angle drive with input shaft below and the worm gear or output shaft above. Overall dimensions are: 4¾-in. long 3-in. wide, and 6¼-in. high. Ratios available range from 6-1 to 58-1, input horsepower is from ½ to ⅝ and output torque (1800 r.p.m. input) ranges from 103 in. lb. to 168 in. lb., depending on ratio. Input shaft diameter is ½ in. with 1⅝-in. extension; output shaft diameter is ⅝ in. with 1 15/16-in. extension. Housing is of aluminum alloy.

Truck Features Steel Safety Cab

THE FOUR WHEEL DRIVE AUTO Co., Clintonville, Wis., has resumed production of model YU truck. A standard model before the war, the YU, rated at 28,000 lb. gross vehicle weight, has been entirely redesigned. New features include: an all steel safety cab, with greater visability than before; adjustable seats; insulation against heat and noise; and overhead map compartment. Side panels

Model YU, re-designed for greater driver comfort and greater serviceability, is shown here with 5-6-cu. yd. dump body for highway hauling work

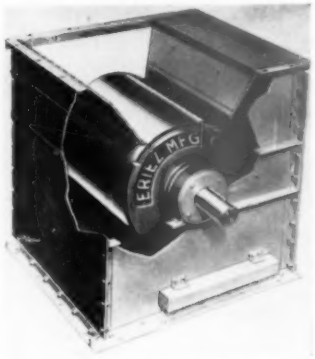
of the hood can be lifted for simple servicing from "catwalks" that are provided on the top of each fender. The truck has a 5-cu. yd. dump body.

Improved Plow-Steel Slings

PALMER-SHILE Co., Detroit, Mich., is now in production of a wire rope sling manufactured from plow steel. Slings are made with 6-in. loops and in ⅛-in. increments from ⅜- to ¾-in. rope diameters. Wires are of six strands with 37 wires per strand.

Magnetic Drum Separator

ERIEZ MANUFACTURING Co., Erie, Penn., is producing a completely self-energized magnetic drum requiring no electric current to produce a magnetic field. Powered by Eriez designed Alnico magnets, the unit is adaptable for the automatic removal of tramp iron and fine ferrous contamination where materials are conveyed in spouts, chutes, and similar conveying systems not employing belts.



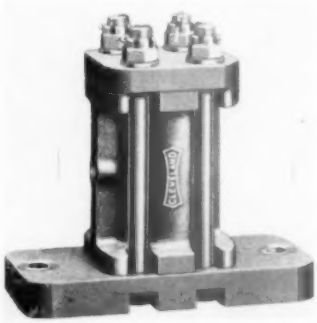
Magnetic drum separator

The drum separator consists of a revolving cylindrical shell within which a stationary high-powered, permanent non-electric magnet is located. Non-magnetic material is discharged first and separately, while the magnetically susceptible portion is held against the shell until it passes out of the magnetic field. Units are available in 18 different sizes including 12-, 18- and 24-in. diameters and in drum widths up to 50 in.

Air-Operated Vibrator

CLEVELAND VIBRATOR Co., Cleveland, Ohio, announces a new air-operated vibrator that is particularly adapted to use on bins and chutes throughout the rock products field. Attached to bins, chutes, batchers, etc., the vibrator aids in overcoming arching or plugging of granular materials.

The unit is obtainable in six piston-diameter sizes, suitable for bins containing one to several hundred tons of material, according to the manufacturer. The vibrator is designed for continuous or intermittent service and all moving parts are reported to be hard-chrome plated to withstand wear.



Air-operated vibrator for attachment to bins or chutes as an aid in preventing arching. Obtainable in six piston-diameter sizes

Heavy Service Magnet

DINGS MAGNETIC SEPARATOR CO., Milwaukee, Wis., has developed the "Deep Burden" suspended rectangular electromagnet for removing tramp iron from exceptionally heavy burdens of material carried on belt conveyors or passing down chutes. Claimed to be the strongest magnet known in the world, it can be installed suspended over conveyor belts, spouts, or chutes, and is designed for any application where heavy burdens or exceptionally fast belt speeds make it impossible for standard magnetic separators to do an effective iron-removal job.

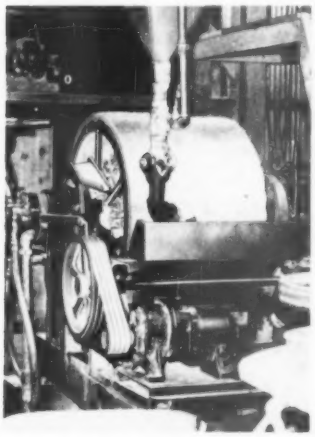
Safety Helmet

INDUSTRIAL PRODUCTS CO., Philadelphia, Penn., is manufacturing a line of "Turtleback" safety helmets and caps, made of a multiple layer of cloth impregnated with bakelite, molded under pressure of 250 lb. at 300 deg. F., producing a tough, shock-resisting shell with lightness of weight. The liner is attached so that the weight is evenly distributed, the lace being of nylon for long service life. A leather sweatband is adjustable to head sizes $6\frac{1}{2}$ to 8.

Drum and Disc-Type Filters

MORSE BROS. MACHINERY CO., Denver, Colo., are now in production of a complete line of both drum and disc-type filters, together with a complete line of auxiliary equipment such as vacuum and filtrate pumps. Drum filters are available in sizes from 3 x 1 ft. to 8 x 10 ft. and disc filters range up to 8-ft. 6-in. dia. multiple disc units.

All filters are automatic and continuous in operation and are claimed to give dependable operation at low cost per ton of material handled. Drum filters are normally manufactured with sealed heads, but for applications such as fluorspar, open-end drums are supplied at lower cost. Repulper and wash apparatus may be varied to suit special installations.



A 3- x 2-ft. drum filter in an Illinois fluorspar plant which operates from a $\frac{1}{2}$-hp. geared-in head motor by V-belt drive and uses 150-mesh stainless steel mesh on the drum surface, which is approximately 18 sq. ft. in area. This filter takes its feed from flotation cells producing acid spar concentrate

Increase Generator Line

ELECTRIC MACHINERY MANUFACTURING CO., Minneapolis, Minn., has announced that the new "Packaged"

Generator with exciter, built-in voltage regulating circuit, and self-contained main generator switch on ratings up to 15 kw.

Generator line, featuring complete unit of generator, exciter and built-in voltage regulating circuit, has been extended to include a self-contained main generator switch on ratings up to 15 kw. No additional switches or controls are necessary. The unit is connected direct to the load. The complete line features units in single and 3-phase ratings up to 150 kw. at speeds of 900 to 1800 r.p.m.

Primer For Metal

WILBUR & WILLIAMS CO., Boston, Mass., announces a combination chemical pretreatment and primer for metal known as Rust-O-Primer which eliminates the necessity of having to remove all rust or to have surfaces perfectly dry before painting. A vinyl base, the primer is applicable over wet, dry, clean or rusted metal, and is said to provide a paintable foundation for any type of paint.

Safety Goggle

WILLSON PRODUCTS, INC., Reading, Penn., has added two newly styled MonoGoggles to its line of personal protective equipment for industrial use. Made of a one-piece plastic lens, the MonoGoggles are said to offer

Lightweight goggle made of one-piece plastic lense available in curved or straight design

wide, clear vision and ample eye protection; they are lightweight and have good impact resistance and low heat transmission of the lens. Both flat and curved lenses are available in either clear or green acetate and are replaceable. Frames for all styles are available in clear acetate and mottled brown Polythene.

Portable Seismograph

THE BARRY CORP., Cambridge, Mass., and Westinghouse Electric Corp., Baltimore, Md., have developed a portable seismograph for recording vibration. Utilizing the same principle employed in instruments registering earthquake shock, this industrial seismograph is a combination of a special seismic pendulum mounting and vibrograph, and analyzes vibrations with frequencies as low as two cycles per sec. The vibrograph embosses a permanent record of vibrations on a transparent film, and the seismic pendulum provides a vibrograph support whose natural frequency is lower than the frequency of the vibration to be measured.

Seismograph set up to analyze vibration effects of heavy machinery on factory walls

Outlook:

Producers Forecast

CAPACITY PRODUCTION IN 1949

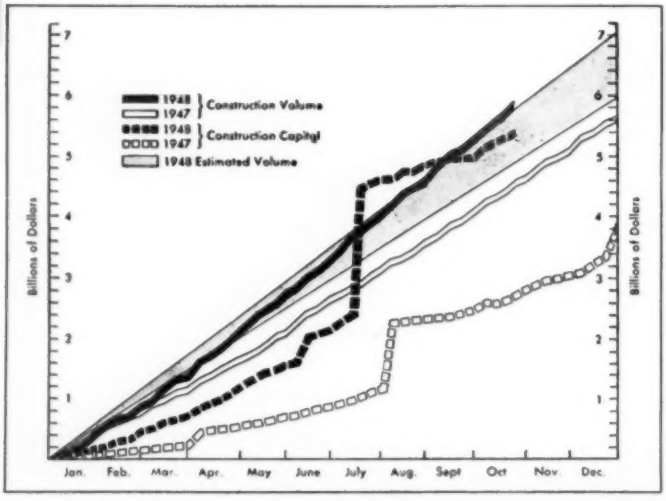
Large backlog of unfilled orders carried over from 1948; cement supply, the possibility of excess profit taxes and labor are viewed as uncertain elements in the filling of large pent-up demand for materials of the industry

By BROR NORDBERG

THE YEAR 1949 will be one of the best in history for the rock products and concrete products industries from the standpoint of volume of business. Demand for products of the industries will approach if not equal that for 1948 and, in many localities, will exceed the record-breaking volume for that year which, speaking generally, taxed the ability of nearly all producers to keep their customers satisfied.

Our appraisal is largely from a summary of replies by producers in answer to our letter requesting opinion as to the business outlook for 1949. It was with some misgivings that we dispatched our letter so soon after the polls of public opinion by Dr. Gallup and others had back-fired so completely in forecasting the national election. We anticipated that there would be some reluctance to go out on a limb in making forecasts and the editors, too, recognized that surveys as such are, at least temporarily, likely to be discredited.

We had an excellent return, nevertheless, and from all branches of the industry in all geographical sections of the United States. We thank those who were willing to risk a forecast at this time. The letters we received were extremely interesting and, if anything, we believe them to be more reliable than the ordinary. Obviously, our correspondents were more cagey than usual and their comments were tempered with caution and backed by factual information in appraising prospects for business. They told us of backlog orders already on hand and enumerated types of contracts that almost assuredly will be carried through or awarded regardless of political considerations.



Construction volume and new construction capital for 1947-1948 as reported in "Engineering News-Record"

We asked:

"In view of the unexpected turns of the national election, what do you think will be the effect on the prospects for business in 1949? What is your forecast for volume of business, percentage-wise, according to use or application of your products?"

General Summary

In nearly all instances the opinion was expressed that the outcome of the national election would not have any marked effect on business volume in the year just started. The chief reason given is that a large volume of unfilled contracts has been carried over from 1948 due to excess demand because of urgent and necessary construction that will be pushed. In many cases this accumulated backlog will keep operations to capacity at least for the first half of 1949, which would equal 1948 production levels. Those who predict top production for the first six months, because of guaranteed business, in general anticipate that the last half of the year also will hold up, because there is more activity by State, Federal and county road-building agencies. The portland cement shortage throughout 1948 is responsible for much of the backlog of needed construction since inability to secure sufficient cement particularly late in 1948 did reduce the level of output in many areas to well below capacity levels.

The feeling of optimism is, however, reserved for the immediate future by many and is not unanimous, even though nearly so, by those who will immediately benefit because some producers are wary of what the new Congress will do. It is recognized that the Truman administration is committed to a policy of maintaining full employment, which indicates that federal support including subsidies will be given when and where needed to take up the slack. This in itself will guarantee favorable conditions for agricultural markets and various classes of construction but the minority who are pessimistic anticipate

Near Scottsbluff, Neb., this new gravel plant which produces six sizes of aggregates is typical of many that have been designed in anticipation of favorable business for construction

eventual and drastic re-adjustment. Others expect a gradual but not too drastic leveling off period during which prices and costs will become realigned, and some believe that that time is at hand.

According to the Bureau of Labor Statistics, U. S. Department of Labor, dollar volume of new construction to be put in place in 1949 will reach a new record of $18.75 billion but physical volume will likely not exceed that for 1948. Most of the increase in dollar volume, about 5 percent, will be in outlays for new public construction and very little change is anticipated in private expenditures. Average construction costs in 1949 are expected to be about five percent above the average for 1948.

The threat of the re-imposition of heavy excess profits taxes is of concern to many producers, who anticipate a great volume of business accompanied by lessened profits. Already they see signs that expansion plans and building are progressing more cautiously, and indications that customers are inclined to hold back to see what develops. In a few isolated cases, a marked drop-off was experienced immediately following the election but, in these instances, it was anticipated that the trend in business would again be upward after the wearing off of the initial shock of the election returns. This dropping off has been mainly in industrial building.

Another item of concern is labor. It is feared that encouragement of labor by the government might start another period of labor difficulties, with serious effects on production and added costs that will further cut into business returns.

Those who depend heavily upon farm markets are optimistic for several years ahead, and it is apparent that road construction is gaining momentum to more than take up the slack due to some falling off in other construction activity. A need for additional revenue to finance highway building to meet urgent needs is recognized in some states. Consensus is that residential building has passed its peak and that rental building will not pick up much as long as rent controls govern. Backlogs needing up to two years for fulfillment are reported and quite a few producers venture so far as to predict very prosperous conditions for at least five years ahead. Principal needs mentioned most often are farm-to-market roads, institutional building and various public works.

Availability of portland cement will have effect on the extent of construction. It appears that demand will again exceed supply in 1949, although the margin will not be so great as in 1948, and there is some objection to diverting cement to large public works before other needs have been fulfilled.

Some who predict that 1949 volume of business will equal that for 1948 comment, significantly, that a return to competitive selling will be required to accomplish that goal. A buyers' market is at hand and they seek extended marketing areas and new outlets. Portable plants for aggregates production have made considerable inroads particularly affecting stationary plants where increasing freight rates have restricted shipping range to a fraction of what it once was.

Crushed Stone

Stone producers report that residential construction has decreased but that the volume so used is insignificant when compared to highway construction. However, they say that tax revenues are insufficient to finance the building of needed highways and suggest that higher gasoline taxes are necessary to finance needed construction. They also fear that the portland cement shortage will handicap the program although some predict that the rate of road building the next five or ten years will be higher per year than it has been the past ten years. Producers in Pennsylvania, which has a record-breaking state highway building program, anticipate a 30 percent increase in volume of demand in 1940. Part of the increase will come from increased ballast requirements. Agricultural limestone, nationally, is expected to increase in tonnage now that a $262,500,000 federal soil conservation program has been approved. A few of the comments by individual producers follow.

The possible adverse effect of excess-profits taxes is mentioned in the following from a large eastern producer of commercial crushed stone in New York who nevertheless commented optimistically:

"We do not feel that the national elections will have little effect on the prospects for business in general in 1949, nor do we feel that it will have any marked effect upon our business in particular. The only deterrent to purchases and general spending, we

feel, is the one brought about by the threat of an excess-profits tax.

"As to the outlook for our business in the coming year, we look for a continuing high level of demand at a somewhat slightly increased price. This price increase will, we hope, be able to slightly more than offset the expected increases in the cost of operation and in the costs of labor."

Another optimistic report, by a New England producer, was as follows:

"I wish to state that it is my personal opinion that the national election will not have any effect whatsoever on our industry. However, I do not expect that this will be true for industry in general.

"Our products are crushed stone, ready-mixed concrete and concrete pipe, and we expect to do about the same amount of business in 1949 as we did in 1948 which is at a high level and perfectly satisfactory as far as we are concerned."

The steel industry anticipates a continuation of heavy production. A large eastern supplier of flux stone and supplementary commercial crushed stone commented:

"You, of course, are aware of the tremendous amount of steel being made today. Naturally, our fluxing stone business is the same. My feeling is that this condition will continue at least through 1949, and possibly much longer.

"As for the commercial stone business, I expect we will have an excellent year in 1949. It may not keep pace with fluxing stone since it depends on different factors; however, I am personally optimistic for the coming year, at least in our territory."

A large southeastern producer of crushed limestone, in predicting a small reduction in volume, stressed the need for municipalities to raise more funds for construction, as follows:

"We anticipate for 1949 a small reduction in demand for stone products in our area, not over 10 percent. Prospect for railroad ballast is not good. Municipalities need to spend much money, but cannot secure the necessary funds. Highways have about the same money available as in 1948."

A very optimistic report came from an Iowa producer of aggregates for road construction, who tells of changed specifications as well in the following:

"Definitely in the season just closed for 1948 our volume of road surfacing was far above anything we have had before principally because of unusually favorable weather. Prices were lower but the large volume more than offset that angle. In talking with four county engineers, all stated that they would do more work in 1949. They will change their specifications from a maximum top size of 1 in. to ¾ in. for all surfacing material, which will greatly aid in the maintenance of surfaced roads. All in all, I would say that in Iowa, for the next six or eight years, surfacing and grading of roads will be above the past 10 years' average."

A Missouri producer, anti-Truman incidentally, indicated that the prosperous farmers in that state will reflect in prosperous conditions for the crushed limestone industry, as follows:

"Due to the election of a Democratic president and Congress, I believe the prospect for business in general for 1949 is not as good as it would have been had the election gone Republican.

"As to my personal business for 1949 I expect that my business will be affected little one way or the other since the agricultural limestone budget has been set for 1949, and in this particular locality most of the road surfacing is paid for directly by the farmers. We have had an exceptionally good crop year in 1948 and that income is the source of revenue for the 1949 surfacing program."

The coming year can turn out to be a record-breaker for the sale of agricultural limestone according to a producer serving St. Louis and surrounding area. He sums up the opinions of other producers as well:

"It is my personal opinion that sales of agricultural limestone in our area during 1949 will be considerably greater than during the year now ending. The national election should play a part in helping to increase limestone tonnage, but I feel that the increased appropriations for conservation practices, committed by the 80th Congress long before the election, will be the most important single factor responsible. The election results, obviously the wish of the majority of farmers in this country, should help loosen farmers' purse strings a bit through assurance of continued price supports and a strong agricultural program in general. Had the election gone the other way, I believe the farmers' fear of a Republican government's influence on agriculture would have tended to nullify a good bit of the tonnage one would naturally expect under a strong conservation program.

"I just returned from the Farm Show in Chicago, and 1949 limestone prospects were the chief topic of conversation among producers in attendance. Strangely enough, several of the men I queried on the subject were not as optimistic about 1949 as the situation apparently indicates they should be, and I cannot help but share some of their misgivings about a possible disappointment in the banner year alleged to be approaching. Our own sales were hurt considerably during 1948 by a disastrous and costly strike at the plant of our suppliers, but I still feel that we will have to do some tall hustling this coming year to increase our 1949 tonnage to anything like that we enjoyed during 1947."

Another producer of crushed stone in Pennsylvania predicted a large increase in volume of business for producers throughout the state, as we anticipated in view of the determination of highway officials to carry forward the most ambitious program of road-building in the state's history. His comments were:

"Locally we expect an increase in crushed stone business of about 30 percent. This will be partially caused by the Pennsylvania turnpike extension, but the major portion of this increase will be occasioned by the greatly accelerated highway paving program, as well as increased use of ballast for railroads.

"The demand for ready-mixed concrete in our local area is constantly increasing. We anticipate an increase in sales of better than 15 percent. The same condition seems to prevail throughout the industry.

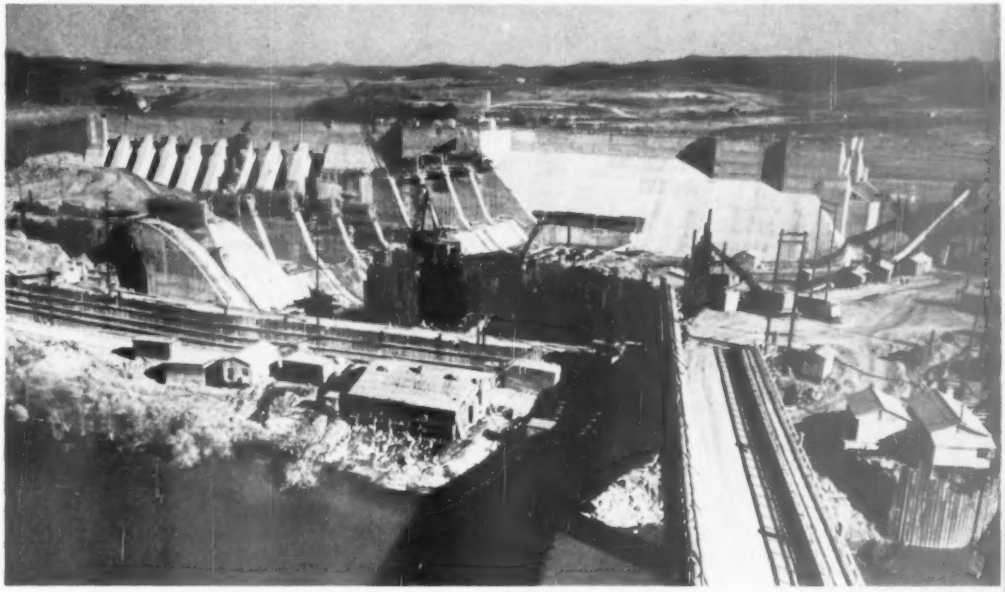
"Our position in the crushed stone industry is hardly unique. Most operators with whom I come in contact are anticipating greatly increased demands for their products over the sales of 1948 and are being governed accordingly."

The situation with respect to agricultural limestone in Missouri was summed up well by Paul N. Doll, enterprising manager of the Missouri Limestone Producers Association. He also presented some sound advice and precautions to producers generally which we quote herewith, with his specific permission:

"Agricultural limestone use will be substantially larger in 1949 than 1948. Nearly every authority who is connected with this industry in any manner agrees on this point. The reason is obvious.

"It is expected that the Congress will appropriate the authorized $262,500,000 as proposed by the 80th Congress. This will make available about double the amount of money to farmers for soil conservation practices, compared with 1948. The increased farm program appropriation will be used primarily in increasing the number of tons of agstone per farm, rather than for advancing more money per ton of agstone, to farmers. This is very significant because most of us believe the main reason our tonnage was down in 1948, as far as the farm program is concerned, was that the tonnage allotted to each farm was so small that the farmers, by and large, didn't want to go to the trouble of signing up for their limestone allowances.

"However, substantial producers in some areas believe that, although 1949 undoubtedly will be a better year than 1948, it will fall below 1947, our banner year, because many Missouri farms are reaching a temporary 'saturation point.' Many farmers do not have any fields on which to spread liming materials in the next few years.



Concrete dam construction projects like this will become important outlets for cement and aggregates as the government-inspired program for navigation, power development and water conservation develops

This condition will be eased shortly because the average application of agricultural limestone lasts only eight years, and farmers who have limed heavily or completely during the past two or three years will relime their fields in a few years.

"We must caution limestone producers to exercise sound judgment and much business acumen if they are contemplating sizable expansion because of the favorable outlook for soil conservation appropriations. Men who are expecting to enter the field of limestone production should examine all phases of their prospective businesses before investing in crushing equipment. Most important of these phases are: (1) volume of potential markets; (2) nearness to existing producers; (3) quality and extent of their limestone deposits; (4) cost of opening and operating a quarry, and (5) kind and amount of equipment to purchase. Failure to explore any one of these factors thoroughly may cause a venture to result in disaster.

"The day is gone when a producer can remain prosperous if he is only producing agricultural limestone. He must adapt his machinery or install equipment that will allow him to produce various sizes of limestone aggregates for road building and other construction work, in conjunction with the production of agricultural limestone.

"Except in metropolitan areas, it is doubtful that a limestone producer can remain prosperous unless his plant is portable. This situation holds only where there are adequate limestone deposits located throughout an area of operation. Experience is showing that it is much cheaper to move a portable plant near to a job, even if the tonnage is rather small, rather than transport materials excessive distances. This condition will become more prevalent as time goes on.

"Agricultural limestone will have to be 'sold' even in years when federal funds are available in large amounts. Few of us realize the great need for merchandising our product, not only to farmers but also to the public as a whole."

The most profitable year of 44 years in business is forecast by a Pennsylvania producer of lime and limestone. He commented:

"I am of the opinion that the outcome of the national election will have very little to do with business in 1949 proceeding in a normal manner. Generally speaking, the writer feels that we are in for a somewhat gradual recession until prices and wages become more normalized. I also feel that this would have happened regardless of which candidate was elected.

"Without a doubt, many lines of business have already slowed up to a considerable extent, although this is not true, as far as we know, of the lime and limestone business.

"With respect to this corporation, we have more business booked for next year than we have ever had booked in our history this far ahead, and because of many improvements in our production methods that have been made during the past seven years, we sincerely believe that next year, which will be our 44th year, should be the best from a profit standpoint that we have ever experienced.

"We firmly believe that, in most instances, general business conditions will not support a further round of wage increases and candidly, we can't but feel that the demands of the various unions have been more largely responsible for the inflation that has occurred to date than any other thing."

Portland Cement

A summary of opinion as expressed by portland cement manufacturers indicates that demand for portland cement generally will again exceed available supply although by not so wide a margin as in 1948. The full effect of capacity increases made in 1948 will be felt in 1949, and those companies which have increased production through rehabilitation and building of plants anticipate record-breaking volume. Others expect to equal 1948 sales. High-cost plants in 1949 again will not experience the competition that would otherwise challenge their very existence.

Some slight loss in standard cement production will come because a large number of cement manufacturers are stepping up masonry cement production. The more optimistic see up to five peak years ahead due in part to the fact that concrete has displaced lumber and steel in many applications.

Some of the more significant comments are presented herewith as follows:

A midwestern manufacturer with potential capacity equal to what it was in 1948 commented:

"Present indications lead us to believe that we can make and sell about the same volume of cement that we did in 1948 which to date indicates one of the best years of our operation. This opinion is, of course, entirely dependent upon the construction industry maintaining its present level of activity."

Another manufacturer, in Pennsylvania, has the same potential capacity as in 1948 and remarked thusly:

"We expect our business to be good in 1949. It will be about the same as it was in 1948. This, I believe, applies to the crushed stone and portland cement industries, especially in this area."

One of the very large eastern manufacturers, with a number of plants, wrote interestingly:

"As far as the cement industry is concerned, it is generally expected that the demand will exceed the supply during 1949. I understand from many contractors and cement users that they intend to stock up on cement if possible during the winter season to offset the shortage which caught most people last year.

"The warm weather has permitted construction into the winter so far that the overall consumption this year was not affected seasonally as far as late 1948 was concerned. If it was not for this late warm weather many contractors could not have completed their jobs which were held up due to previous shortages. Many cement companies have added somewhat to their capacity in 1948, the full effect of which will be felt in 1949. This will help some but it is not expected that it will satisfy the demand.

"Many companies are expanding a bit further in 1949 but not on a large scale. A number of high-cost operations will remain in service only while the demand for cement is so great, but will be abandoned when it falls off. Several small companies are in operation today only because real competition does not exist. Their costs indicate that they will fold up as soon as a slump occurs which may not be for several years.

"Many companies are increasing their production of masonry cement and 1949 will see a substantially better supply probably with a slight loss of standard cement since much standard cement goes to masonry work at present. The overall effect will be favorable and everyone will be better off. Masonry cement is easy to make and it is hard to see why most companies have not pushed it further along before this.

"Most companies are looking to the future and are doing everything possible to improve plant efficiency. It is generally felt that at least five years of full production is ahead. Masonry construction is the lowest in cost. Concrete is now frequently used in place of steel. Farmers who will continue to have money are using more cement. Oil well cement consumption increases yearly and must continue to do so because oil production must be sustained or increased. Concrete pipe becomes relatively less expensive each year and its use compared to tile, iron and steel will increase."

Public works and flood control projects are expected to prolong high demand for cement for a long time, according to a single mill manufacturer who wrote:

"We are planning on a continuation of the present heavy demand for cement during 1949. We believe that any drop in the small user and housing field, will be more than offset by federal and state projects. During the past year we have passed up many opportunities to quote on large construction projects being built by both the Army Engineers and the Bureau of Reclamation. It is our firm conviction that the demand for cement on public works and flood control projects will hold the demand for cement at its current high level for some time to come."

Anticipating the biggest sales volume in its history, a California manufacturer had this to say:

"We feel that business conditions in general might have been more favorable under a Republican administration and congress. Otherwise, the national election will not have much direct bearing on our operations. Because of our plant location, we stand to benefit from work on the Central Valley Project. While both Truman and Dewey were pledged to expanded public power and irrigation projects in the west, probably a Democratic congress will be more sympathetic to government spending of this nature than a Republican congress would have been.

"The outlook for our industry and for our own company is favorable and the year 1949 should be approximately equal to 1948. Sales volume for 1949 may be the best in our history because we have increased our capacity somewhat in recent months. The large population increases in this part of the country, and the unsatisfied demand for public construction, should cushion any decrease in general construction activity."

Sand and Gravel

Comments from the sand and gravel industry follow generally the pattern of remarks by the crushed stone industry, in observations on the outlook for business. A good number of producers who expressed opinion are also in the ready-mixed concrete business and some of them anticipated possible reduction in volume through shortages of cement as they affect concrete sales which reflect in sand and gravel tonnage.

Nearly all companies expect 1949 volume of business to equal that for 1948 but a slight reduction in volume, possibly three to six per cent, as predicted for the industry by one producer who has been in contact with others over the nation. That would be insignificant because there is some trend to smaller product sizes, etc., and 1948 placed demands on the industry that took its capacity. Our summary, however, indicates that volume will hold in 1949. Further freight rate increases, if granted, will result in more shift of tonnage from stationary to portable plants.

NOTE: *More comments on the outlook for 1949, as compiled from letters to the industry, will be published in the February issue of* ROCK PRODUCTS. *The prospects for business for the sand and gravel industry will be considered in more detail, as will the outlook for the industrial sand, lime and other divisions of the industry.*

One of the aggregate plants supplying the atomic energy building project in eastern Washington

Overall view of plant. Note typical limestone bluff in background

Modernization program is keynote of anniversary celebration at Menke Stone and Lime Co., Quincy, Ill.

By GORDON R. LACY*

85th Anniversary Marked in Production of Lime and Stone

THIS PAST YEAR the Menke Stone and Lime Co. of Quincy, Ill., celebrated the 85th anniversary of the founding of the original Menke company in 1863. Frederick W. Menke came to the United States from Germany by boat, arriving in the Port of New Orleans, from where he came to Quincy in 1852. After serving apprenticeship with a well-known stone-cutter, Mr. Menke began to realize the possibilities of the limestone bluffs along the Mississippi River, and in 1863, in company with George Goetsche, William Tieman, and John H. Bitter, organized the firm of F. W. Menke and Company.

Rapidly expanding from the four original names, the company soon employed as many as 150 men in quarrying and cutting stone, producing lime, and doing a wide range of building contracting in Illinois, Missouri, and Iowa. Many fine public and private buildings still testify to the quality of the work done by this group. The firm, incorporated in 1911 and reorganized in 1929 under the name of Menke Stone and Lime Co., does not produce cut stone today, but still is actively engaged in production of lime and limestone products; in doing stone and concrete construction work; and dealing in a general line of builders' supplies. Cut stone now required for such work is supplied from Bedford, Ind.

Modernization Program

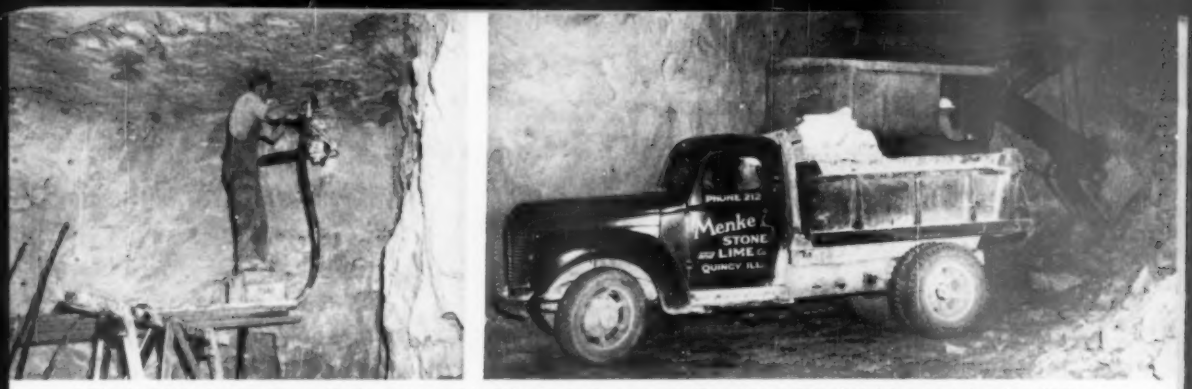
Since 1941 a progressive program has been in operation to modernize and generally improve the facilities for lime and limestone production at the plant, south of Quincy. In 1942 a new vertical kiln was built to augment the lime production from the existing three natural draft kilns then available. This kiln was fired with natural gas under natural draft for several years. In 1945 a modern primary crushing plant was installed to eliminate the heavy labor involved in hand breaking and loading of required stone. In 1947 the new kiln was remodeled to use induced draft, still using natural gas as fuel, and applying it through an Azbe center burner arrangement which incorporated the Azbe system of hot zone recirculation in the kiln.

At present the new kiln carries the load of lime production except when repairs must be made or gas shortage forces shutdown of the kiln. The two remaining natural draft kilns are pressed into service as standby units using coal or wood or both as fuel when gas is not available. Plans now are being formulated for the erection of another Azbe kiln at which time an Azbe gas producer also will be installed to provide an alternate fuel system when natural gas supplies are curtailed in the winter months. This will allow operation of the modern kilns continuously and permit removal of the two older kilns to provide more lime shed working and storage space.

In 1948 the pebble lime unit of the lime plant was remodeled to include adequate crushing, elevating, sizing,

Reclaiming lump lime from draw floor preparatory to crushing

*Azbe Corp., St. Louis, Mo.



Drilling blast holes for instantaneous blasting system used in driving header for room and pillar mining system adopted to remove stone from bluff adjacent to plant, and right: Electric 1-cu. yd. tunnel shovel loads stone to 5-ton truck. Note extremely short boom

and storage facilities for burned lime. Also, this year the secondary limestone crushing plant has been moved from its previous location to a point nearer the primary crushing system, thus eliminating a truck haul of material. This shift concentrated operations in a smaller area and made the secondary crushing unit generally more efficient.

Diversified Production

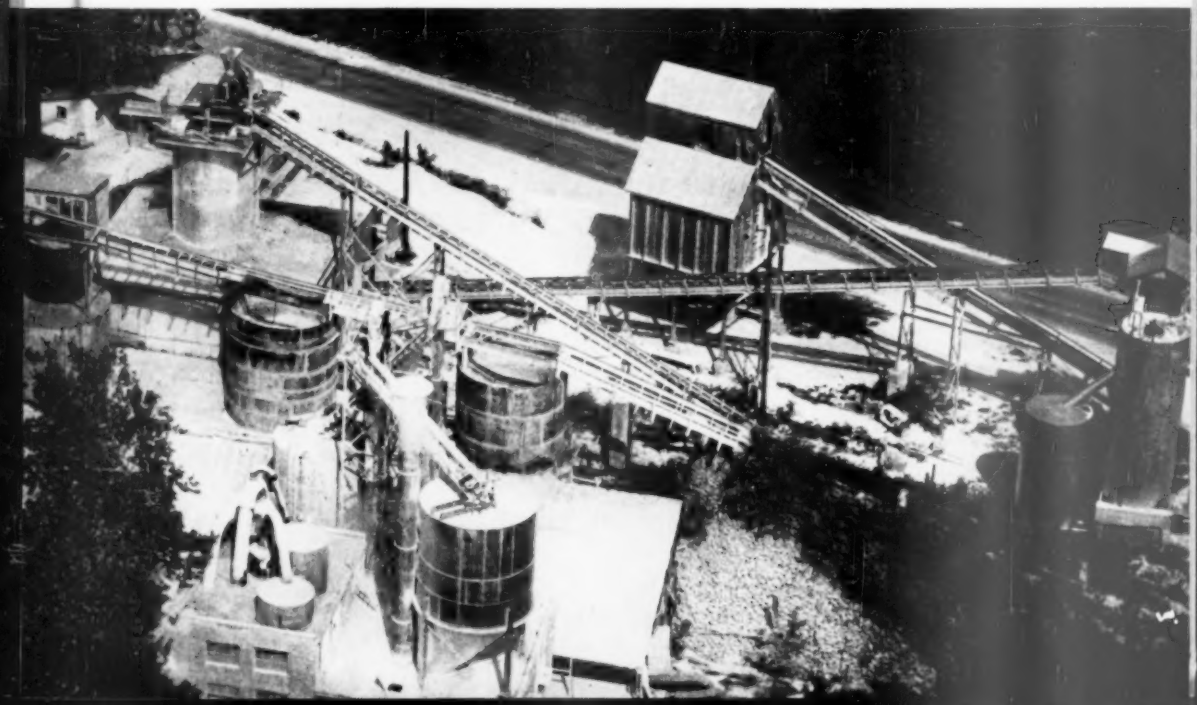
Limestone products include agricultural limestone, concrete aggregates, stock food filler and fluxing stone. Lime products include crushed lime, pebble lime, lump lime and hydrated lime. These latter products find their way into water treatment processes, straw-board mills and as steel fluxing materials, to list some of the principal uses.

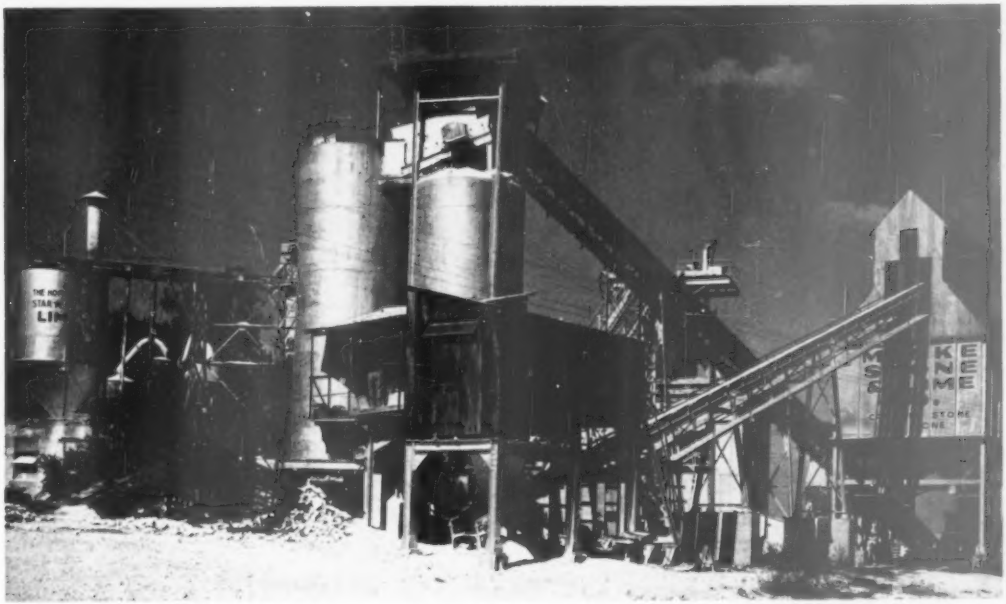
Stone is produced from a room and pillar mining system driven at plant ground level into the Mississippi River bluff adjacent to the plant site. Drilling is done with a Gardner-Denver No. 79 auto-feed drifter mounted on a column. The face in each room is driven at a 16-ft. height which allows loading of the stone to 5-ton dump trucks by a 1-cu. yd. Bucyrus-Erie electric tunnel shovel. Blasting is done with Trojan 40 percent dynamite fired instantaneously. Quarry production is about 300 t.p.d., six days per week.

Trucks haul the limestone to the primary crushing plant where it is fed by apron conveyor to a 21- x 42-in. McLanahan and Stone single-roll crusher set for minus 8 in. The crusher product is elevated by a 24-in. belt conveyor on 168-ft. centers to a single-deck, Simplicity primary scalping screen with 4-in. square openings. Discharge from the top of the screen, minus 8-in., plus 4-in., goes to either of two kiln stone storage tanks and the fines, minus 4-in., go to a third tank.

The secondary crushing plant is now arranged so that the fines or any excess or kiln stone sizes may be reclaimed directly from their storage bins through a 16-in. x 5-ft. Diamond plate feeder over a 24-in. belt conveyor to a Williams No. 20 slugger mill. Grate bars of this mill are set to give a range of openings from $\frac{1}{2}$ to 2 in. Discharge from this mill goes over an 18-in. belt on 116-ft. centers to a 3- x 8-ft. three-deck Simplicity screen. Screen sizes on these three decks are: $1\frac{1}{2}$, $\frac{3}{4}$, and 5/32 in. with square mesh openings on the top deck. The screen is located above a four compartment storage bin into which the four screen products are spouted by gravity. Suitable hoppers on the bottoms of these compartments permit easy loading.

Menke Stone and Lime Co. plant with truck hopper for commercial stone, center background. Left, center, may be seen top of kiln and extreme right are tanks for sized stone. Hydrate plant is at bottom center to the left

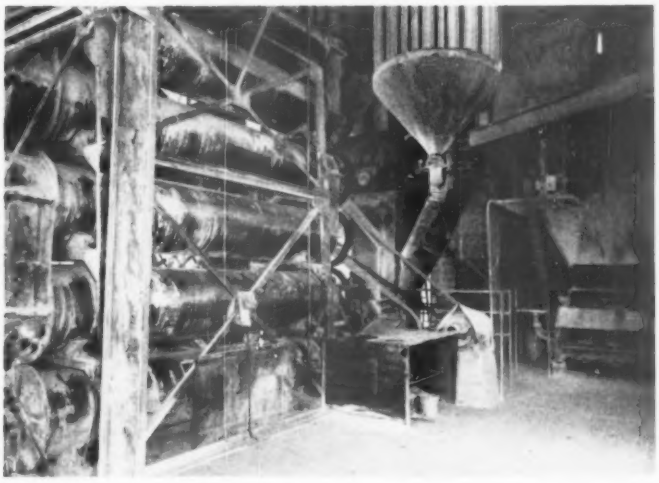




Tanks, center, for sized stone. Note vibrating screen on top of right tank. Shed, foreground, houses secondary crusher which discharges to belt for material transfer to commercial stone truck hopper, right. Quicklime tank, left background. Portable conveyor is located under left hand tank for truck loading of sized stone

The two kiln stone bins are located over a pit into which the kiln-charging car is lowered to receive its load directly through a quadrant gate in the bottom of each bin. Of the side-dump gable-bottom type, the charging car carries about two tons per trip up a 30 percent incline to the kiln top. The charging doors at the kiln top are so arranged that the car traveling toward the dumping point opens the doors, and the car door latches are automatically released when the dumping point is reached. A counterweight and cable return the car to the crown of the incline, charging doors close, and car returns to the foot of the incline by gravity.

Six-drum continuous hydrator, left, located in new hydrator unit. Raw material from this machine passes through a beater mill that is equipped with a deflector-type separator and air float system. Sleeve-type dust collector, center



New Kiln Installation

The new kiln has a 14-ft. diameter shell enclosing a shaft suitable for producing 40 tons or more of lime per day. Induced draft is provided by a Clarage No. 23 fan connected to the kiln top. Recirculation gases are handled through a Clarage No. 19 fan built to stand passage of kiln exhaust gases at 900 deg. F. Side burners are provided in the kiln, but are only used at intervals to heat up weak spots, the principal fuel admission being through the center burner structure. Lime is drawn from the kiln to a hand-propelled buggy from which it is dumped on the lime shed floor for storage or sorting. Sorting is done only on the day shift.

From these floor piles it is reclaimed by a Hough Payloader with front end scoop and dumped into the hopper over a 16-in. x 5-ft. Diamond plate feeder. The feeder discharges to a Mclanahan and Stone Bantam Buster crusher from which it is elevated to a long stationary grizzly which separates the fines from the pebble lime. The fines are stored for use in the hydrator and the pebble lime is stored for loading to cars or trucks or for passing through a Sturtevant No. 1½ rotary crusher to reduce it to fines suitable for hydration.

(Continued on page 117)

A 23-hole blast by split-second delay firing in limestone at Tompkin's Cove, New York

PHOTOGRAPHY
A Practical Aid to Blasting

New York Trap Rock Corp. photographs primary shots to test blasting techniques and to locate mis-fires and faulty practices as an aid to effective use of explosives in delayed action firing

By L. F. MILLER*

WHEN WE think of quarry operations and primary blasting we immediately have thoughts of a big noise, followed by flying stone and a huge cloud of dust. After a few minutes the dust will clear away and we can look over the results, make comments and start thinking about where the shovels will start digging.

What actually happens when firing a primary blast consisting of a number of well drill holes, each loaded with high explosive, is that when a signal is given the switch is closed and the entire side of the quarry face seems to be moving outward as it peels off the bank. Someone will call out, "Watch that bottom come"; another will say, "Did you see the third hole blow out?" and many other comments are often heard when one of these big fellows lets go. Possibly there are some who have eyes fast enough to follow the movement of the stone and even to see in detail what happens in certain holes, but I have talked with "old timers" who have had many years experience in blasting and have never found one who will say that he can actually tell from observation what has happened when a blast fires. The general agreement is that the stone moves out so fast that the eye is too slow to follow and be positive in detecting anything that took place.

We are particularly interested in what actually happens as the stone

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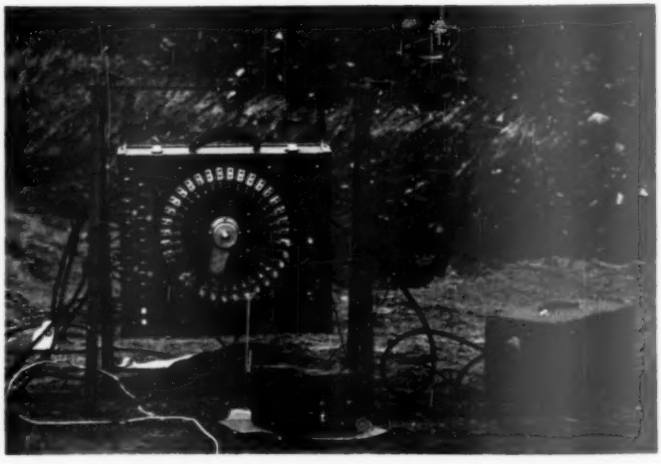

Delayed-action blasting switch set up and connected, ready to fire a 20-hole blast. Camera relay is shown directly in front of switch

is breaking. Of course, we can see the different holes fire in a well timed "delayed action blast." We can also see the stone peel off the face, but this is nothing more than a spectacular sight, beautiful to watch but so far as seeing where it breaks and, much more important, where it does not break is something that cannot be determined by the human eye. Therefore, our only method of obtaining a true picture of what takes place "behind the scenes" is by the use of photography in connection with primary blasting. In this manner we can see exactly what is taking place as the blast is firing and, after a careful study of the pictures obtained, it can usually be determined what actually happened and, in most cases, why it happened.

Discovering Faulty Practice

Let us take a case which occurred recently in one of our quarries. We were ready to fire an 18-hole shot on a sloping bank. On one end of the shot the holes were 90-ft. deep while on the other they had tapered down to 40 ft. About the middle of the shot there was a valley where the holes were several feet shallower than those on adjacent sides. Before firing the blast, several of us walked to a location about 200 yards from one end of the shot. As it fired all of us saw the entire bottom blow from one of the holes in the valley. We could not be certain which particular hole had blown, but all agreed that the bottom had blown out as the stone had been thrown several hundred feet out in the quarry. Naturally, we discussed the blow-out thoroughly in an attempt to determine the cause, since we felt certain the bottom had been very solid and tight at that point. We had cameras set up to photograph the shot at two different positions. It was finally decided that no conclusions could be reached at the time and that we would wait until the pictures were developed in order to find out for certain which hole had blown, and then try to determine the cause of the blow-out. We developed the pictures that night and, much to my surprise, it was discovered that there had been no blow-out at the bottom of any hole but instead a blow-out had occurred well up the face, as could be seen in the picture. After taking the picture (reproduced herewith) to the quarry the following day, we went up on top of the bank and looked down. There, at the place where the blow-out had occurred, was a clay seam which would ordinarily not be noticed. One of the deck loads had been right behind this seam. Future loading in that section carefully avoided this seam and other seams, and there have been no further blow-outs.

Most operators will probably think that there is little anyone can tell

(Continued on page 84)

Top of hole blowing out which onlookers thought to be bottom—this photograph disclosed what really took place

Pictures exposed too early do not show the shot advanced enough to determine breakage, but in this case such exposure was intentional as the Primacord had been lost in hole No. 2 and the picture was exposed at 0.420 sec. to determine whether or not the hole fired. As can be noted by studying the photograph, hole No. 2 fired

Pictures exposed too late show nothing but a cloud of smoke and dust. This picture was snapped at 2.620 sec. after the first hole fired

The series of ten pictures on these two pages gives graphic proof of the value of photography in answering specific blasting problems and improving blasting technique

1. This blast consisted of two rows of well-drill holes with three holes per row fired in sequence at a delay of 0.026 sec. Exposure: 0.140 sec. after first hole fired

2. Results of blast No. 1

3. A combination of well-drill and vertical wagon-drill holes firing. Well-drill holes were loaded half-way up the face and filled in with stemming. Vertical holes were drilled down to where the explosives ended in the well-drill holes and loaded with dynamite. Vertical holes were spaced 5 x 5 ft. and each group was fired by a Primacord connection to its adjacent well-drill hole

4. In this blast a smaller sized powder was tried and space between decks reduced. This helped but many big blocks can be seen coming out as the blast fires. Also the entire slab on top is lifting and little breakage is taking place

5. Results obtained by reducing distance between decks

6. For the following blast, space between decks was lessened still more and the top slab was drilled to a depth of 7 ft. with 1¼-in. bits. These holes were scattered between the well-drill holes and fired with Primacord connected to them. Time interval: 0.0123 sec.

7. Results of first combination well-drill and jackhammer blast, showing a number of large blocks still present

8. In this blast the powder was reduced sufficiently to make a full column load to within 12 ft. of the top in 15 well-drill holes. The 250 jackhammer holes were laid out in a square pattern spaced 4 x 4 ft. and drilled to a depth of 7 ft. All were connected by Primacord and each group fired with its respective well-drill hole. Delay interval: 0.0123 sec. This picture, a close-up of a blast firing, probably represents the greatest amount of action ever photographed

9. Showing final solution of the problem, with a great deal of the credit going to photography. Notice even breakage which will require very little secondary reduction

10. This is a close-up view of the quarry face near the top as it looks after a corner primary shot is fired. Notice the taper to the jackhammer holes and also how clean the top slab is cut off with no trace of back break. The stone shot down in the quarry is well broken

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A perfectly-timed exposure at 1.230 sec. Arrow points to a missed bottom charge. Decks had fired in the hole but bottom failed. Mis-fires can quickly be spotted in photographs

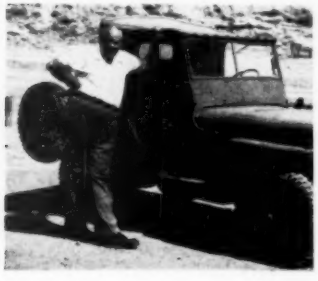
them about blasting conditions in their particular quarries, which is certainly true in most cases, but the use of photographs made at the time their blasts are fired does not mean that someone is trying to tell them how their shots should be loaded. Instead, it affords a simple means for them to find out for themselves the effectiveness of their blasting. There is nothing complicated about the procedure and certainly no expensive equipment is required. Just an ordinary camera and a little practice will do the job and, in a short time, it can then be determined where and why the stone is not breaking as it should. This is especially true if there is some particular part of the quarry where the conditions might always appear to be such that nothing can be done to get good breakage. It might be the opinion of some that they must take movies and see the entire shot from start to finish in order to get the true picture. In most cases this is a mistaken idea, because it is not possible to get the details from moving pictures that are to be found in a good still photograph which can be studied. While it is true that a movie projector can be stopped and a study made at any instant, when this is done the enlargement is so great that very few fine details can be seen.

How to Take Pictures

When taking still pictures of a blast firing, the most important consideration is to have the camera mounted on a good substantial support. It need not be an elaborate tripod, although this has a tremendous advantage because it can be set up at any location. The most important thing is to make certain that the camera is absolutely solid and that it does not move when the picture is snapped. No one can hold a camera steady enough to get a sharp picture, because it is next to impossible to prevent some body movement at the time the shot fires. While a high speed camera will "stop" the movement of the stone better than one with a slow shutter, any speed of one hundredth of a second or faster is sufficient. Of course, better pictures can be obtained on a clear day but this is not essential. The more important part is to use a fast film. Any of the various fast "press" films will give good results under almost any weather conditions.

The actual exposure of the film must be at exactly the precise instant in order to produce best results. It can be observed, after all the holes have fired, that there is a certain time when the stone is actually in suspension. It is at this time that the shutter should be snapped. By waiting only a fraction of a second too long nothing will be shown but a cloud of smoke and dust but, during that short earlier interval, the entire mass will be breaking and every detail can be seen. After taking a few pictures, it is an easy matter for any producers to determine just when the exposure should be made.

L. F. Miller, New York Trap Rock Corp.



Side view that shows how a new explosive is pulling the bottom. Exposure: 1.300 sec.

Camera Operated Off Switch

In our operations we have devised a method of taking the pictures which works in connection with the delayed action switch. The camera is operated in the same manner as one of the holes firing. The switch in use is particularly adaptable for this kind of work since it is of the rotating type with 31 contact points, any one of which can be connected to the camera. This is true, even though one of the holes to be fired is connected to the same contact point as the camera connection. The camera connections interfere in no way with the firing of the hole. Two wires are run from the switch to the camera which can be located much closer to the quarry face than would be possible for anyone to stand safely and snap the picture. One of these wires connects to the common line at the switch and the other connects to the point where we wish to make the exposure.

The wires lead to the camera where we have a small transformer which reduces the voltage from 110 to 6 volts. The cameras in use are of the conventional Speed Graphic Press type. Each is equipped with an electric solenoid which operates the shutter when power is applied. After the camera lines are tested, the cameras are set up and focused on the face at the location where the blast is to be fired. The shutters are then cocked. Then, as the blast fires and the lines are energized, the shutter snaps and we have the picture.

When blasting with the switch set for a delay interval of .030 second, one full sweep of the rotating arm will represent a total elapsed time of .900 seconds after the first hole fires. This is just a little early to snap the picture in most cases. To overcome this, we built a little relay box which connects to the switch. The common camera line is carried through this relay which is normally open. We have found that the best pictures are obtained about 1.350 to 1.500 seconds after the first hole fires so, instead of snapping the picture on the first sweep of the rotating arm as the holes are firing, we snap it on the following turn. By connecting the camera lead to a point equivalent to the 45th contact point the picture is exposed at 1.350 second so we connect one camera lead to the fourteenth point and the other to the relay. As the arm makes its first revolution and fires the holes, it simply passes the 14th point and fires the hole but the camera does not operate because the common line is open. On the second sweep the relay has closed the common line and when the arm comes in contact with the 14th point both camera lines are energized and the picture is snapped.

This method of taking the pictures is particularly useful in making special blasting tests. If we are testing a new explosive we always set the cameras to operate at exactly the same time used in taking previous pictures at that location. Since we always know the exact instant to .001 of a second when any picture is exposed, it is a very easy matter to take the picture, showing the new explosive firing, and make comparisons with previous ones to determine any difference in action that takes place as the blast fires.

Side view to determine action of smoke holes fired in connection with a nine-hole well-drill shot. Exposure: 1.300 sec.

A well-timed front view exposed at 1.230 sec. Note how the face is starting to transfer toward hole No. 1 on left. It is this transferring of the stone that produces good fragmentation since it is during this process that the grinding action takes place in delayed-action blasting

Practical Example of Use

We do not take pictures of all blasts but any time when difficulties are encountered, or expected, we set the cameras up and find out just what takes place as the blast fires. A good example of what can be accomplished by using photography in connection with primary blasting may be seen by observing the series of pictures shown. We erected a new plant at a location where a quarry had previously operated and where a good face had been opened. The limestone was of a very seamy formation with the seams running both vertically and horizontally. The horizontal layers were of a variable thickness but, on top, was a solid 8-ft. layer, separated from the lower section completely and with nothing but dead weight holding it in place. Our first shot produced very poor results. We then tried shooting a double row of holes and this proved to be much worse than the previous one.

(Continued on page 114)

National Lime Association Looks Ahead

Research for product improvement and market development, plant operation to be intensively stressed in ambitious program of National Lime Association

Robert S. Boynton, general manager and treasurer

By ROBERT S. BOYNTON*

IT WAS BACK in June 30, 1903, that a group of progressive lime manufacturers met at the Boody House, Toledo, Ohio, and gave birth to the National Lime Manufacturers' Association, one of the oldest associations in the non-metallic minerals field. That the founders of this Association gave substantial impetus to this industry movement is evidenced by the fact that it has been in continuous existence since that time, though, in 1922 when this organization became incorporated its name was changed to the National Lime Association.

Changes in Industry

While there have been many changes in the industry since the Association's inception, four particularly significant developments have occurred during these 45 years. One was the development of commercial hydrated lime. Before this time the industry had only one product to sell—quicklime. At present there are 120 lime plants that produce and sell hydrated lime, and the total production of this form of lime today approximates 33 percent of the current total lime production, exclusive of dead-burned dolomite. A second development was a steady but drastic reduction in the number of lime plants. In 1909 there were 1213 plants; in 1920, 515 plants; in 1930, 375 plants; until in 1946 there were only 182 plants. Oddly enough, the demand for lime has increased considerably during this period. In 1946, 182 plants produced and sold about 117 percent more lime than 949 plants in 1908. A third development was the pronounced changes in kiln designs and methods of manufacture. Rotary kilns, some of which are capable of producing in excess of 300 tons per day, have been installed at several plants. Highly mechanized, gas-fired, large capacity vertical kilns have been built in recent years. More and more instrumentation is being adopted by the more progressive companies in place of the traditional "rule-by-thumb" method of burning lime. As a result of this trend, a large lime plant of 40 years ago would be classed as a small plant today. Simultaneous with the trend to fewer lime plants has been the even more drastic trend to much larger capacity operations. For example, including dead-burned dolomite, it is estimated that eight companies now sell over 50 percent of the total lime production in the United States. Fourth, vast change has taken place in the markets for lime. In 1907, an estimated 78 percent of the total lime shipments were made to the construction and agricultural fields and the balance was consumed by industry. In 1946, 77 percent of the total lime shipments (including refractory dolomite) were directed to industry as chemical, or fluxing or refractory lime. Of the balance, 16 percent went into construction and 7 percent into agriculture.

Quite naturally, the activities of the National Lime Association have undergone radical changes over these years until today the keynote of the Association is *research, market development,* and *operations.*

Since 1942 there has been an unprecedented demand for lime. Even today, three years after VJ-Day, there have been only brief spells on a localized basis when there has been an excess of lime. In view of this brisk demand, the directors of the association quite logically decided that advertising and promotion should be subordinated in favor of research. In 1946 the association developed a five-year research program designed to strengthen the position of lime in present markets and to develop new outlets for the future "rainy days" ahead. As a result, the association is now spending the greatest percentage of its budget for research in history.

Fundamental Research

Too often in the past scientists have progressed in their research on lime problems and markets into "blind alleys" where they were unable to proceed further because of a lack of basic information on lime. As a result, a long-needed fundamental research program on lime was established at the Massachusetts Institute of Technology. This is slow, tedious, undramatic work; yet it is quite possible that some new, possibly revolutionary, facts on lime may germinate from the program. The investigations under way at M.I.T. cover particle size and surface area measurements; a study of the calcining of various types of limestone at different temperatures and lengths of time and observing the different slaking and settling characteristics of those limes (work performed with small laboratory rotary kiln); studies on plasticity, porosity, density, autogenous healing, and dispersion of lime hydrates. It is hoped that at the conclusion of this research it will be possible to improve the quality and uniformity of lime, as well as learn why two limes of apparent identical physical and chemical characteristics react differently in the hands of the consumer.

Trade Wastes

A relatively new market for lime has been given real impetus by the recent development and enforcement of pollution control regulations by many States to curb the flagrant pollution of streams by industry and municipalities. Just before the adjournment of the 80th Congress, a federal pollution law was passed and signed by the President. Lime definitely has a number of applications in the treatment of many different trade wastes. However, there are a number of chemicals and reagent materials, as well as non-chemical treatment processes, that compete with lime in this field. From the standpoint of potentiality it would appear, conservatively speaking, that lime's position now with respect to this market is similar to its position in the water softening field at the end of World War I.

A long-range research program was established by the National Lime Association at Rutgers University under the direction of Dr. Willem Rudolfs, generally recognized as probably the "top" national authority in this field. One phase of the work has dealt with pickle liquor wastes. With lime treatment of these wastes, voluminous sludge is formed which presents generally a severe disposal problem. In research at Rutgers efforts have been concentrated on discovering methods of reducing sludge volume. This work has helped

*General manager, National Lime Association.

†This and succeeding statistics, some by interpolation, were obtained from the chapters of the U. S. Bureau of Mines Minerals Yearbook.

to solidify lime's position in pickle liquor treatment. Other specific trade wastes are being investigated and fundamental research is being conducted on limes as neutralization agents. Technical papers from these researches are published in trade journals and presented at technical meetings, which serve to publicize the proper usage of lime in this field.

Coincident with the work at Rutgers, the Association has and is preparing technical bulletins on this subject which further publicize the value of lime in waste treatment. Bulletins to be printed this year include "The Use of Lime in Industrial Trade Waste Treatment," "Lime versus Caustic Soda and Soda Ash as Acid Neutralizing Agents," and "Lime: Storing, Handling and Application in Treatment Processes." Literature of this kind placed in the hands of sanitary consulting engineers cannot help but make them more conscious of lime, and these are the men who usually design the treatment plants and select the treatment process to be used. Supplementing this technical information are publicity articles on actual trade waste plants using lime developed by the Association staff as a result of correspondence, plant investigations and attendance at sewage-trade waste technical meetings.

Agricultural Research

The N.L.A. is now in the midst of the third year of a four-year agricultural research program which covers a broad study of soil-liming problems at five State agricultural experiment stations, New Jersey (Rutgers), New York (Cornell), Ohio State, Penn State, and the University of Maryland. Research fellows and state agronomists from these schools have been meeting with National Lime Association members once a year to discuss their research findings as well as research investigations for the future. There has been a noticeable tendency among these agronomists toward more uniform thinking on many of the controversial liming concepts since these meetings were instigated by the N.L.A. A complete book on all phases of liming, authored by these five agricultural experiment stations and published by the Association, will result from this program. The book will represent the consolidated thinking of these schools on all liming questions and should help considerably in standardizing the thinking in general on the subject.

William T. Harvey, Jr., chemical engineer

Lime Stabilization

With the tremendous publicity given in postwar years to the acute housing shortage, the public as a whole has not been fully aware of the pressing need for more roads, particularly access and farm-to-market roads, and the extensive maintenance and repairs required by existing roads today. Highway construction suffered just as badly as home and industrial construction during the war, leaving an enormous backlog of road building to be done for many years to come. More and more road engineers are concentrating on subgrade treatment and road base construction in order to lend more permanence to postwar roads.

The practice of "stabilizing" these road bases is being practiced more and more even though stabilization often is an expensive process. Graded aggregate of the proper physical characteristics is the most common and logical method of stabilizing road bases. Yet, there are an increasing number of areas where road aggregate is not readily or economically obtainable. Furthermore, there are some instances where aggregate alone will not achieve the degree of stabilization desired, because of peculiar soil conditions, often characteristic of sticky, highly plastic clay soils. As a result, for a number of years road engineers have been using and experimenting with additives for subgrade treatment and base construction. Asphalts, tars, cements, and calcium chloride have been commonly used for this purpose. On sandy soils which have no cohesion, clay has often been added to develop some degree of plasticity. The reverse is also true where sand is added to reduce the plasticity of silts, loams, and clays that possess too much plasticity for proper base construction. In the last few years the Texas Highway Department has become interested in hydrated lime as a stabilizing medium for certain soils and has done considerable laboratory work in adapting the use of lime in varying amounts to various types of soils found in Texas. The results as a whole have been highly satisfactory to date, and Texas now has stabilized over 100 miles of road with hydrated lime.

From the beginning, the National Lime Association investigated and followed the progress of work being done in Texas on lime stabilization, and has cooperated with its highway department to the fullest possible extent. A year ago the Association established a research program at Purdue university to study the effect of the addition of lime in varying percentages to a wide range of soils and from this work develop specific methods of tests that can be generally used by highway departments throughout the country, enabling them to evaluate the possibility of using lime in a simple manner. While this work is still unfinished, it is evident from the tests thus far that lime in varying quantities has a decided beneficial effect on quite a number of different types of soils throughout the country. It would be folly to consider lime as a "cure-all" since from the tests to date there also are quite a number of soils where lime produces little or no effect.

Gladys L. McBee, assistant secretary

Although predictions on the future of lime in the road field are somewhat premature at this time, it does, nevertheless, appear that road stabilization does offer attractive future market possibilities for the lime industry. So far it has proved to be at least as economical to use as any other admixture in many cases. Amounts of hydrated lime being used have ranged from only 2 percent to 5 percent by weight. In addition to this relatively light application, the average delivered price of hydrated lime per ton compares favorably with cement, asphalt, and tar. While graded aggregate, sand, or clay soils are admittedly far cheaper than lime per ton, it is entirely conceivable that in some cases lime may prove to be more economical to use than these other materials. For example, if lime is readily available from a producing point 100 miles away, it might be more economical to use 3 percent of lime by weight than 35 percent of road "metal" located only 25 miles away, considering the greatly increased labor involved in handling and spreading such a much greater volume of aggregate. Lime's function to date has been PI (Plastic Index) reduction on highly plastic types of soils, usually sticky clays. In some cases lime has reduced the plasticity markedly—as much as 300-400 percent. Some of these marginal soils would be useless from a road building point of view if the PI was

(Continued on page 128)

Trends in

CRUSHING PLANT LAYOUT

Primary crusher selection and relation to shovel capacities and existing plant equipment discussed in considering plans to increase plant capacity

By R. F. FEIND*

INCREASED DEMANDS for rock products, especially for highway and other construction work, as well as the greater call for smaller size stone, has made it necessary for existing plants to seriously consider increasing production by adding new equipment to both the quarry and plant operations.

Many plants are now working overtime or operating additional shifts to meet these demands, while others have already added equipment which has increased production.

In most of the older plants, stone from the quarry fed to the primary crusher is conveyed directly to the screening and recrushing section of the plant. The result is that the entire plant is working under the handicap of a very irregular and interrupted flow of material throughout.

These irregularities are caused by delays occurring when loading the stone in the quarry, transportation to the primary crusher, and delays in clearing the receiving opening of the primary crusher when blocking or bridging occurs.

The surge loads resulting from this kind of operation greatly affect the over-all average capacity of the entire plant, and the elimination of these surges is very important when revising the design of a plant to increase its capacity.

The present trend is to install a new primary crusher, the product of which would be elevated by a belt conveyor to a surge storage pile. The rock from this pile would then be fed to a second belt conveyor at a smooth uninterrupted rate of flow to the remaining portion of the plant. Revisions in the old existing plant would have to be made, as the feed would no longer be quarry run stone but of a size produced by the new primary crusher.

In some existing plants the quarry is located in a pit below the surface. The transportation system for hauling the blasted stone from the power shovel to the crushing plant in some plants consists of a locomotive and a string of cars operated on tracks to an incline where the cars are hauled singly up an incline with a hoist. A considerable saving can be effected by installing the new primary crusher in the pit below the quarry floor and elevating the crushed product from the primary crusher with a belt conveyor to the surge pile on the quarry floor level and then by a second belt conveyor to the existing plant on the surface.

As the transportation system will be on a level quarry floor, the old system of locomotive and cars can be replaced by the more modern system of truck haulage.

As the capacity of the new crushing plant is increased, changes in the quarry equipment will have to be considered; which includes methods of blasting, power shovels, and improved transportation.

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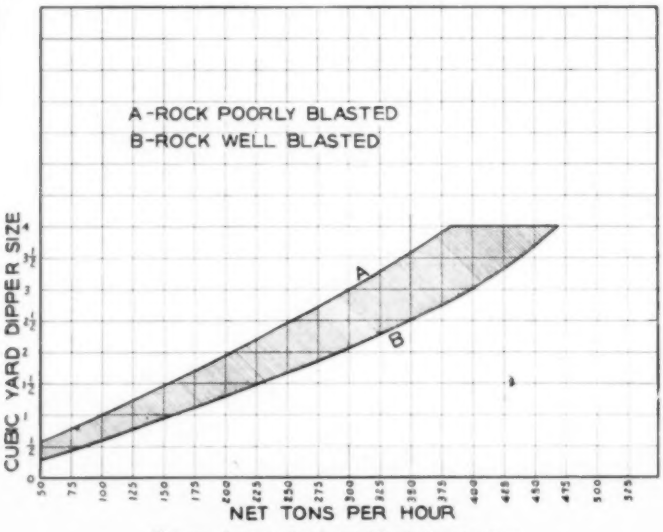


Diagram of power shovel capacities in tons per hour

Primary Crushers

One of the first important steps in the design of a crushing plant of any capacity is the proper selection of a primary crusher, as this machine is usually the largest and most expensive single unit in the plant. A mistake in the selection of this machine can be very serious, and remedying the mistake may require replacement of the crusher or costly changes after the plant is put into operation.

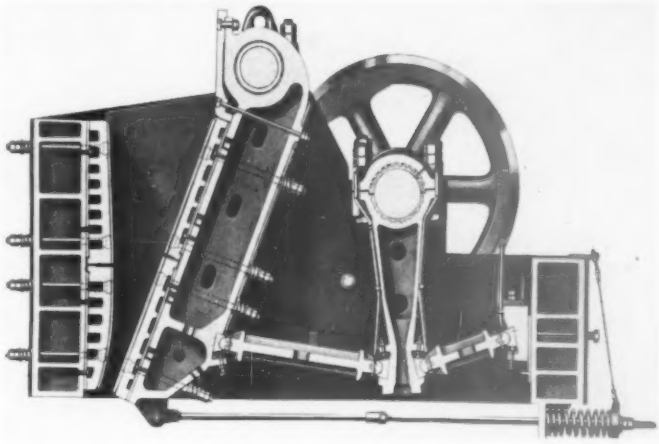
There are a number of important factors which must be taken into consideration, which will not only have a bearing on the type of crusher to be selected, but also on its construction. Some of these factors follow:

Rocks can be roughly classified as shown in Table I.

It can be seen by analyzing the aforementioned table that some of the rocks overlap with regard to their classification, and it is therefore often very difficult to determine their degree of resistance to crushing. Some rocks are considered quite hard but are brittle and fairly easy to crush, while some softer rocks such as limestone can be very tough and offer considerable resistance to crushing. The safest way is to have laboratory compression and impact crushing tests made either

from core-drill specimens or from samples of rock taken from the quarry face after the weathered surface rock has been removed by blasting.

The abrasiveness and the hardness, or crushing resistance of the rock, each have a bearing on how the crusher should be fitted. Manganese steel, which work hardens under pressure, is suitable for hard and tough rocks which are not particularly abrasive. However, excessively abrasive materials may wear away the surface film of manganese steel faster than it is work-hardened, in which case the crushing surfaces will wear rapidly. For such rocks chilled iron or through-hardened alloy steel should be used. A rock which is both hard and lightly abrasive may require considerable experimentation to determine the most economical wearing material.



Showing details of typical jaw crusher

Nature of Rock in the Deposit

Many of the deposits of limestone are thinly stratified, and when blasted break up into small sizes. In this case gyratory crushers should be considered, and if the rock is soft and nonabrasive, single roll crushers or large hammer mills can be used.

If the rock is in the form of a massive formation, and the capacity of the plant is small, a jaw crusher is usually favored. If the plant is of large capacity a larger gyratory crusher would be more suitable. Single roll crushers or hammer mills are not so suitable for crushing blocky or abrasive rocks, and a gyratory or jaw crusher should be used.

TABLE I

SOFT	MEDIUM	HARD	VERY HARD
Asbestos rock	Limestone	Granite	Iron ore (Taconite)
Gypsum rock	Dolomite	Quartzite	Granite
Slate	Sandstone	Iron ore	Granitic gravel
Tale		Trap rock	Trap rock
Soft Limestone		Gravel	

Primary Crusher Capacity

A primary crusher should never be selected solely on the basis of the capacity of the plant as a whole. Selection also depends upon how uniformly the crusher will be fed, or upon what percent of the total crushing time the crusher will operate. This varies with the number and size of the shovels in the quarry, and the capacity and number of units in the haulage system. Other factors to be considered are: quarry delays due to moving the shovel, especially if only one shovel is being used, secondary blasting of large stone, and delays due to unusual weather conditions which may halt quarry and primary crusher operations. At times of these enforced stoppages, the remaining part of the plant can continue to operate from a stockpile of stone which has been produced by the primary crusher.

To take care of these interruptions, the primary crusher should have a rated capacity at least 30 percent greater than the rest of the plant; and in many cases a reserve capacity of as high as 50 percent is desirable.

Sometimes the primary crusher is selected so as to take care of future expansion in the rest of the plant. In this case it may be operated at a lower speed to avoid excessive peak load, and later the speed can be increased when greater production is required.

There are a number of conditions which must be taken into consideration which have a definite bearing on the size of product to be produced by the primary crusher.

Primary Crusher Product

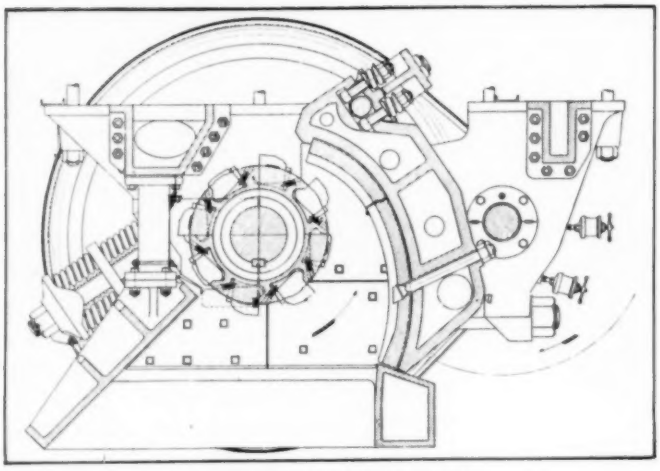
Usually, after a primary crusher has been selected with respect to its feed opening and capacity, it is set at its minimum discharge opening so as to obtain the greatest ratio of reduction possible and reduce the work to be done by the secondary crushers. This is especially true in commercial plants where the largest size stone to be produced is railroad ballast or stone not exceeding about $2\frac{1}{2}$-in. square opening, or in a crushing plant which produces stone for a cement plant or for other plants where the product must be reduced to a size suitable for feed to subsequent grinding equipment. In plants which are designed to produce large fluxing stone, stone to be used for the production of lump lime in vertical kilns, or large rip-rap, the primary crusher discharge opening must be such as to produce these larger sizes of stone.

Primary crushers, both of the jaw and gyratory type, have very little adjustment to take care of wear which takes place on the jaw plates, head and concaves, especially when crushing abrasive rocks. When this wear occurs the product becomes larger, and this must be taken into consideration in the selection of the secondary crushers and of the scalping screens ahead of these crushers. An allowance of from $1\frac{1}{2}$ in. to 3 in. should be made for wear, depending on the size of the crusher.

Feed Opening: Relationship to Shovel Size

The largest size feed to a primary crusher should not be greater than 80 percent to 85 percent of the crusher opening. As an example, a crusher with a 42-in. opening should not be fed with stone having a maximum dimension of more than 34-in. to 36-in.

This brings up the relationship of the shovel size to the crusher opening. In the selection of a primary crusher some authorities contend that the crusher opening should be of such size as to receive the largest size stone which will pass through the shovel dipper. This is not always possible, as it sometimes results in the selection of a crusher having too much excess capacity for the rest of the plant and the high cost of such a machine would be uneconomical. In some quarries where the rock formation is blocky and massive, additional secondary blasting or breaking with "skull crackers" is required to reduce the rock to the proper size for feeding to the crusher. To arrive at the most economical operation, a happy medium must be arrived at. In many deposits such as limestone, the rock is strati-



Diagrammatic drawing of single roll crusher

fied. The thickness of the strata has an important bearing on the size of shovel dipper. A larger dipper can be used when the strata are thin than with thicker strata.

This problem is of such importance that both the shovel and crusher manufacturers should be consulted before a decision is made. The number and size of shovels depends on the length of the quarry face. Two shovels in a quarry give much more flexibility than one single shovel, resulting in a more constant feed to the primary crusher.

Table II gives an approximate idea of shovel dipper to crusher size for both blocky and stratified rock formations, but each problem must be studied carefully before a decision is made. The information has been tabulated merely as a guide.

TABLE III: TABLE GIVING THE DIPPER SIZE IN CUBIC YARDS AS A FUNCTION OF THE STRATA THICKNESS AND CRUSHER FEED OPENING

Gyratory Crusher Feed Opening	Maximum Thickness of Strata in Rock Formation						
	12-in.	18-in.	24-in.	30-in.	36-in.	42-in.	48-in.
20	1	1 1/4					
24	2	1 3/4	1 1/4				
30	3	2 1/2	2	1 3/4			
36		3 1/2	3	2 1/2	2		
42			4	3 1/2	3	2 1/2	
48				4 1/2	4	3 1/2	3
54				5	4 1/2	4	3 1/2
60				5 1/2	5	4 1/2	4

affected by moving the shovel for blasting, the irregularities which occur in the transportation system, weather conditions, etc.

These conditions are difficult to evaluate and may reduce the average capacity on large shovels as much as 25 to 30 percent, and on small shovels as much as 50 percent. The normal operating range of power shovel capacities in short tons per hour is plotted against the dipper size in cubic yards in Fig. 1.

When considering the modernization of an existing plant by the installation of a larger primary crusher, thought must be given to the existing primary crusher which now becomes the secondary crusher. If this crusher is of the gyratory type it is only necessary to remove the old straight concaves and replace them with the curved, non-choking type. With these concaves, the open side setting of the crusher can be considerably reduced resulting in a greater capacity and finer product.

Screening ahead of this or any secondary reduction crusher is a necessity, as all stone smaller than the largest size product should be screened out of the crusher feed.

If the small stone is not screened out ahead of the reduction crushers, packing may occur, especially if the stone is damp, which will materially reduce crusher capacity. It will also result in greater wear of head and concaves, increase power consumption and produce more fines due to interparticle crushing.

By making minor changes, the total capacity of the plant can be increased as much as 50 per cent. Under these conditions the quarry and primary crusher could operate two shifts or eight hours per day, and when necessary, the remaining portion of the plant could operate three shifts or twelve hours per day.

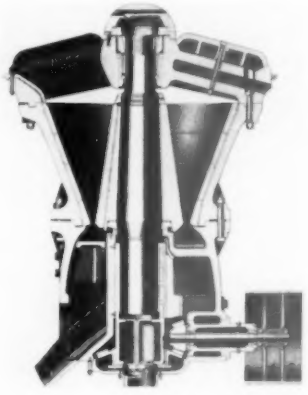
Major changes would have to be made if the old section of the plant is to have the same capacity as that of the new primary crusher.

TABLE II: RELATION OF CRUSHER FEED OPENINGS TO SIZE OF SHOVEL DIPPERS FOR MASSIVE BLOCKY FORMATIONS

Size Shovel Dipper	Gyratory Crusher Feed Openings		Jaw Crushers Feed Openings In Inches
	Usual Practice	Minimum Opening	
4 1/2-Cu. Yd.	60-in.	50-in.	84 x 60
4-Cu. Yd.	60-in.	48-in.	84 x 60
3 1/2-Cu. Yd.	54-in.	42-in.	84 x 60
3-Cu. Yd.	48-in.	36-in.	60 x 48
2 1/2-Cu. Yd.	42-in.	36-in.	48 x 42
2-Cu. Yd.	36-in.	30-in.	42 x 40
1 3/4-Cu. Yd.	30-in.	24-in.	42 x 40
1 1/2-Cu. Yd.	30-in.	24-in.	42 x 32
1 1/4-Cu. Yd.	24-in.	20-in.	36 x 24

Feed for all crusher sizes will require some secondary blasting in the quarry; this depends on how the rock breaks up, and the size of the shovel dipper selected depends on this factor.

Shovel capacities are based on normal rock quarry operations. Obviously, the average hourly capacity during a day's operation will be



Cutaway view of gyratory crusher

Sand Separation

Trends In FINE AGGREGATE PROCESSING

Proper sand cleaning and the use of hydroseparators as a means of meeting stringent current aggregate specifications

By NATHAN C. ROCKWOOD

THOSE WHO HAVE read the article on the new specification requirements of the Corps of Engineers, U. S. War Department, in the December issue of ROCK PRODUCTS have already some idea of what may eventually be in prospect for the preparation of fine aggregates. These requirements are obviously too extreme to be asked for by other purchasers from the rank and file of commercial producers at this time, but they do emphasize a trend that had already started when these were made public. Once again in the long history of concrete construction practice emphasis is being placed on dense or compact mixes, requiring a minimum of cement and water. This means more attention to gradation of aggregate sizes, particularly of the fine aggregate.

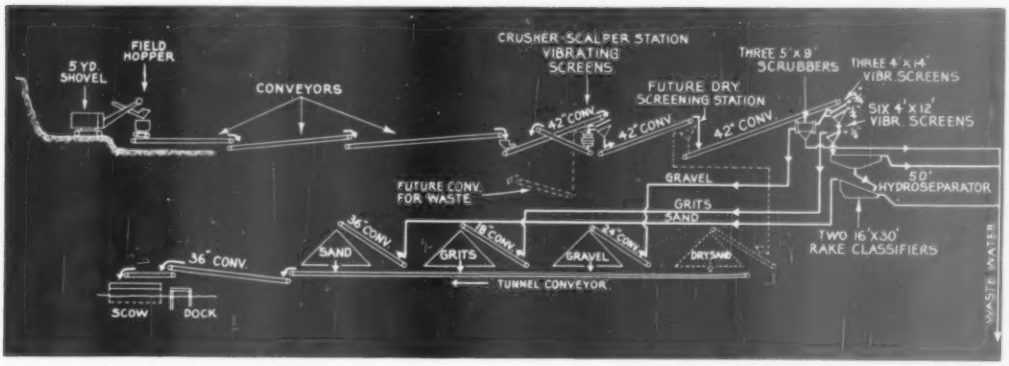
The first evidence of this trend was the requirement for more material in the minus No. 30 plus No. 50, and minus No. 50 plus No. 100 and minus No. 100 mesh size in the standard sieve-size fractions. Producers have had to meet this demand more particularly in finding enough material in the No. 50 to No. 100 sieve sizes, the leeway in the amounts of material between No. 8 and No. 50 sieve sizes having been fairly liberal as now measured by the proposed new requirements. The advantage of a more closely graded material with the requisite amount of fines is not limited to massive concrete structures built by the government. It is equally important to the producer of ready-mixed concrete in that he can make a better and stronger product with less cement, which at the present time is a scarce commodity in many localities.

Hence, this trend toward the more ideal commercial fine aggregate is best illustrated in new plants constructed primarily to supply aggregate for ready-mixed concrete. During 1948 descriptions of two such plants were published in ROCK PRODUCTS, one on the East Coast and one on the West Coast. These two plants, in our opinion, are forerunners of the typical commercial plant of the future. They do not contain equipment or processing methods which have not been used previously, but such earlier installations were designed to make sands more for special purposes than for commercial sand to be used as aggregate in ready-mixed or other concrete. The use of such sand incorporates theories of concrete design long known, but frequently neglected in practice.

Recent Sand Processing

The plant on the East Coast, referred to above, is that built near Port Washington, Long Island, N. Y., by the New York Trap Rock Corp., and sold recently to the Colonial Sand and Stone Co., New York City. It was described in our July issue; for the purpose of emphasizing some of the trends shown, we will repeat a few significant details. First, salt water is used for washing and in the hydraulic separators. Although sea water is slightly denser than fresh water, and it is an electrolyte, we understand no allowance was made in the calculations for its greater specific gravity, nor did it have any apparent flocculating or dispersing effect. Apparently, special attention to the use of salt water in sand separation is an unnecessary refinement in estimating such processing. The flowsheet and the plant are reproduced herewith.

According to the data supplied to our associate editor, W. B. Lenhart, author of the article already mentioned, about 625 cu. yd. of minus



Flowsheet of Port Washington sand and gravel plant, Long Island, New York

Two of three scrubbers, left, with battery of three 4- x 14-ft. vibrating screens, above, at Port Washington sand and gravel plant. In the center is a 50-ft. hydroseparator, with two rake classifiers to recover fines and dewater product to the right

¼-in. material is processed per hour. The minus ¼-in. plus ⅛-in. sand (grits) is removed by vibrating screens and stored separately, to be added to the composite concrete sand in any proportion desired. Even the Corps of Engineers' specification allows up to 20 percent in this fraction. Many sand producers apparently fail to take advantage of this allowance. By using the highest allowable percentage of this fraction the percentages of the other fractions are often favorably affected, and it is frequently as simple to correct a poorly graded fine aggregate by additions at the coarse end as in the fine or intermediate fractions.

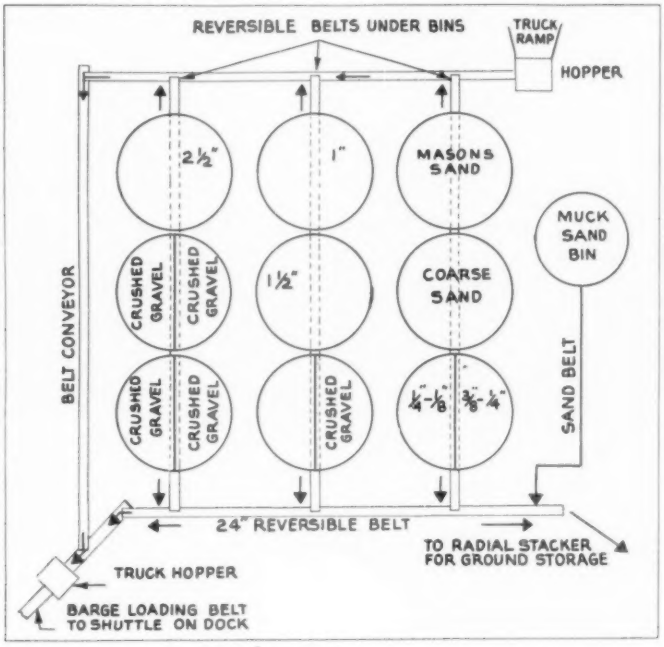
Cleaning First Step

In this instance, and the same would be true in nearly all installations, it was desirable to take out this coarsest fraction ahead of hydraulic separating equipment. With modern vibrating screens it is feasible to screen on a large scale to ⅛-in. size or even finer. Wet screens can give a clean product, and prior screening avoids overloading the classifiers with a size of material difficult to size accurately by the hydraulic method. Another reason given for this particular screen installation was to relieve the strain on the rakes in the next stage of processing, in the 50-ft. diameter hydroseparator.

Readers probably have seen descriptions of hydroseparator installations in which this was used in the final instead of the first stage of processing fine aggregate. We have suggested a number of times over the past few years that the logical sequence of operations is to get rid of the dirt and dirty wash water in a primary operation rather than in the last operation, but only a few plants have been designed that way. At this Port Washington plant, all the minus ⅛-in. material from the vibrating screens goes direct to the hydroseparator, the sole function of which is to clean, and separate from the dirty wash water, the sand at approximately the No. 200 mesh size. How this is accomplished was calculated somewhat as follows, for we do not have the exact amounts and have made assumptions which may not be strictly accurate. Our purpose is merely to illustrate the kind of calculations that are involved in any such problem. We will assume that 10 percent of the 625 cu. yd. per hour is in the minus ¼-in., plus ⅛-in. material, handled by the screens. That leaves 562 cu. yd. per hour to be separated in the hydroseparator at approximately the No. 200 mesh size. A 12-in. pump supplies wash water through 1000 ft. of pipe. Let us assume 5000 g.p.m. is thus delivered to the hydroseparator. This is (5000 x 0.134) about 670 cu. ft. The sand load has been estimated at 562 cu. yd. per hr., which is 9.3 cu. yd., or 250 c.f.m. This is a dilution of 670 to 250 on a volume basis, or about 2.7 to 1. Since the sand is delivered damp, we are safe in assuming at least a 3 to 1 dilution. If the sand had a maximum of about one-third voids, we would have 250 × 110 = 27,500 lb. of sand and 670 × 62.5 = 42,000 lb. of water, or a dilution of 1.5 to 1 on a weight basis. This is not as much dilution as is generally used where a hydroseparator is the final step in the process instead of the first. In other words, we are dealing apparently with a feed of rather thick "pulp" where it enters the hydroseparator. In this case, the hydroseparator actually operates as a thickener, designed to waste only minus No. 200 mesh sizes. The material that settles will be classified to some extent in zones at various radial distances from the center feed inlet, but the bottom rakes gather it altogether into one central sump.

The manufacturer of the hydroseparator tells us its dimensions were determined after many experiments with the materials to be handled and by methods of calculation that are his "stock in trade," so to speak. However, we can test the operation by two formulas that have been published in previous issues of ROCK PRODUCTS, and thus gain some insight into the mechanics involved.

Based on our assumptions given above, which obviously can not be any



Bin arrangement for handling four size fractions of concrete sand. Portland, Ore., sand and gravel plant

too accurate, but will serve as illustration, we have a feed of 15.3 cu. ft. per sec. of which three parts are water and one part sand. The smallest particle it is desired to settle out is No. 200 mesh, or a particle of about 0.08 mm. in diameter, which has a settling rate of somewhere about 0.19 in. per sec. Therefore, it would take about 5 sec. for the particle to fall 1 in., which, it can be safely assumed, is more than the depth of the head on the overflow weir, and hence enough to fall below the surface current effect. If we assume there is 5 percent of minus No. 200 mesh material in the overflow and that of the water fed with the sand about 40 percent (of the sand) is removed with the sand underflow, the weir overflow will be about 7 cu. ft. per sec.

A circular tank of 50-ft. diameter has a perimeter of 157 ft. and since $Q = V \times A$, in which Q = the quantity of overflow, V the velocity of overflow, and A the area of the overflow, or equals $L \times H$, where L is the length of the overflow rim or weir and H the depth of the head on the weir. Then we have $Q = V \times L \times H$, in which both V and H are not known. However, we know that H must be about $\frac{1}{2}$-in. or 1/24 ft. (roughly 0.04 ft.) and substituting this value in the formula gives us $7 = V \times 157 \times 0.04$ or $V = \frac{7}{157 \times 0.04} = 1.1$ ft. per sec.

Since the length of flow from the outer rim of the inlet to the hydroseparator rim or weir is probably about 23.5 ft., a No. 200-mesh particle would settle 4.3 in. in 21.4 sec., so the hydroseparator appears to have ample capacity for the feed given, and could take a considerably larger feed, and still retain most of the No. 200-mesh material. However, allowance would have to be made for the rather thick pulp of which the initial feed is composed. This, apparently, has a specific gravity of about 1.2, which would decrease the settling velocity by approximately 12 percent, at least in the early part of the flow or, in other words, since the falling rate is 0.19, the No. 200-mesh material would not settle faster than 0.17 in. per sec. in the initial flow of the material toward the rim. Probably the entrance turbulence would prevent any fall for a few feet.

If we assume that the specific gravity of the pulp has been reduced to 1.10 at the half-way point, the settling rate of a No. 200-mesh particle would then be decreased about 5 percent or say to 0.18, and it would require about 6 sec. to fall 1 in., and in the 11.8 ft. left of the radial distance to the weir with the current thus flowing at a velocity of 1.1 ft. per sec., the particle would settle almost $1\frac{2}{3}$ in. in the 10 sec. of flow from the middle point of the rim weir. While all this is speculation, it is hoped that it brings out the factors which must be considered; and after these factors are determined theoretically they can be made sure of only by actual experiment and experience with the particular materials.

We can not arbitrarily assume any H, for H and V are inter-related to each other since $V = \sqrt{2gH}$. Hence $7 = \sqrt{2gH} \times 157 \times H = 8 \times \sqrt{H} \times 157 \times H$

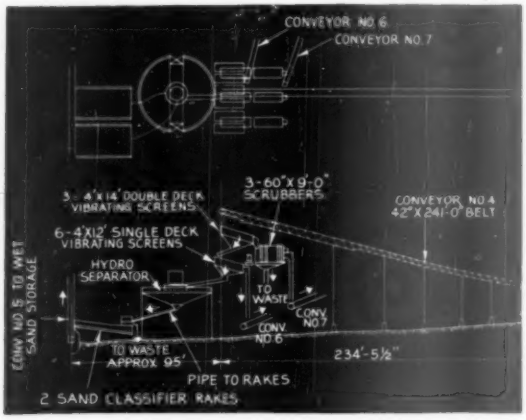
$\frac{7}{8 \times 157} = H^{\frac{3}{2}}$; or $0.0055 = H^{\frac{3}{2}}$ and

One of two Fahrenwald hydraulic sand sizers with eight sorting columns each, in commercial concrete sand and gravel plant, Portland, Ore.

$H = 0.033$ ft., approximately, which proves our assumption of $H = 0.04$ ft. was close enough, although, a recalculation would make $V = 1.35$ ft. per sec. instead of 1.1. This would reduce the settling out period to 17.5 sec., and permit the particle to settle 3.0 in. in clear water in 23.5 ft., or making allowance for the initial specific gravity of the pulp; and counting only half the radius as effective, the No. 200-mesh particle would still fall about 1½ in., which is more than 1 in. below the surface current before reaching the weir. The difference between 0.04 ft. and 0.033 ft. in the head over the weir is therefore hardly appreciable, and probably is less than the mechanical uniformity or levelness of the weir itself.

In this and similar installations, the first step would be to determine the actual time required to settle the smallest fraction it is desired to save in a pulp of similar density to the one to be used in the processing operation. Then, the length of flow required to provide enough time before the particle of the desired size reaches the weir can be readily determined. This calculation involves the amount of feed, the amount of overflow, the length of overflow or circumference of the tank, and the velocity of flow over the weir rim of the tank.

Irving Warner, vice-president, Warner Co., Philadelphia, who installed a similar hydroseparator in 1945 (see ROCK PRODUCTS, January, 1946, pp. 84-86) used an empirical formula derived from Edmund Shaw's book on "Sand Settling and Sand Classifying," as follows:



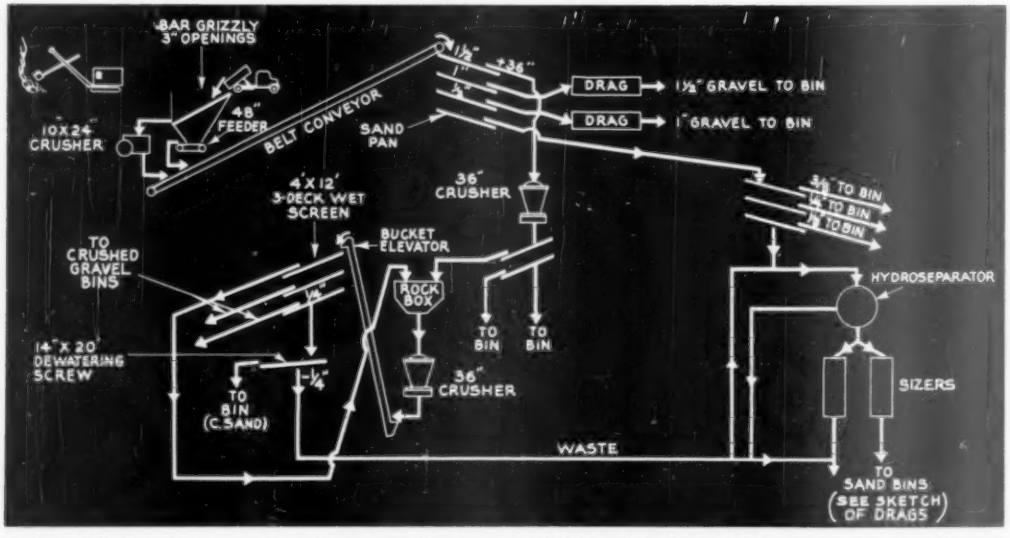
Details of sand recovery features of the Port Washington plant

$A = \frac{M^2 \times G}{140{,}000}$, where A = Area of the settling basin in square feet, M = meshes per sq. in., G = gallons per minute (g.p.m.) in the overflow.

Applying this formula to the Port Washington plant of the New York Trap Rock Corp., we have $A = \frac{40{,}000 \times 3150}{140{,}000} = 900$ sq. ft.

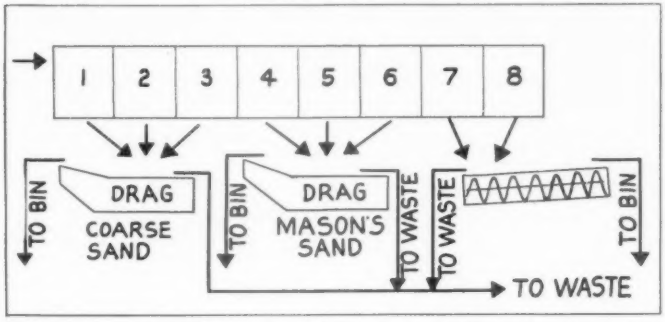
Since the effective area of the hydroseparator chosen here probably is about 1900 sq. ft., it will be seen that this formula provides plenty of leeway. However, Mr. Warner was designing a hydroseparator as an end process for recovering fine material from a very thin pulp, which contained only a small percentage of particles larger than No. 100-mesh size, and these were suspended in 9600 g.p.m. of water. In other words the overflow velocity in his hydroseparator must be nearly three times as great (his tank's effective diameter is 47 ft.), but the particle is falling in practically clear water across the entire radius of flow, so that even though the velocity may be 3.0 ft. per sec., the time required to travel the 22 ft. radially would be 7 sec., or time enough for a No. 200-mesh particle to fall in clear water about 1½ in. The depth of flow over the weir would be about 0.053 ft. or 0.64 in. In the Warner Co. installation about 70 percent of the materials in the feed that passed the No. 200 mesh are recovered, including about 80 percent of that part passing the No. 325 mesh.

The two installations, both of nom-

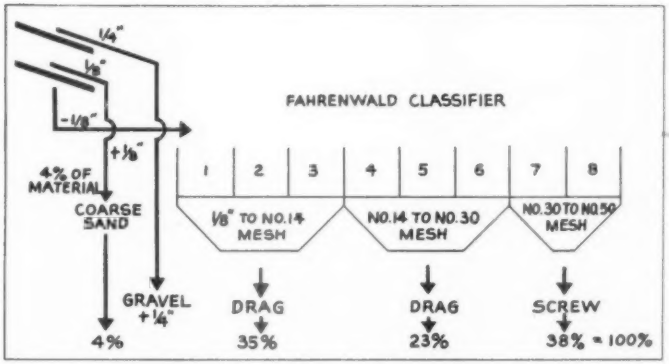


Flowsheet of Portland, Ore., sand and gravel plant. "Classifiers" are an adaptation of the Fahrenwald sizer long used in the mining and metallurgical industry

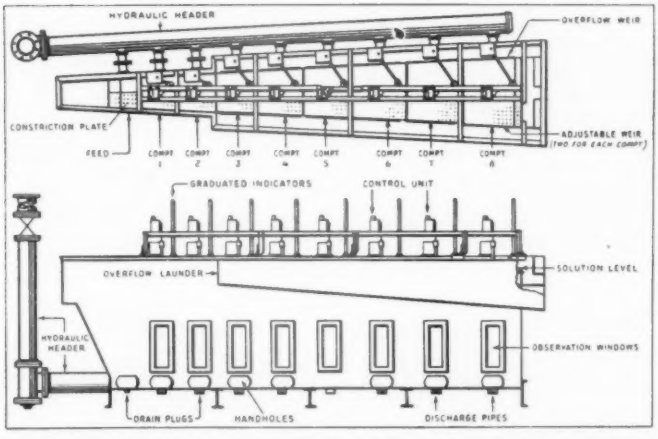
inally 50-ft. diameter hydroseparators, illustrate the adaptation of this device to two quite different aspects of the same problem of recovering fines lost in the ordinary sand and gravel operation. The hydroseparator at the Port Washington plant apparently handles about 750 t.p.h. of sand with about 5000 g.p.m. of water, and the Warner Co. plant recovers about 12½ t.p.h. with about 9600 g.p.m. It is obvious, of course, that had not the Warner Co. fines been so diluted, a much smaller hydroseparator would have accomplished the same result. On the other hand, the very thin pulp makes possible a sharper division in particle size recovered, and in this installation makes efficient separation at No. 325 mesh. The weir velocity can be greater because the pulp is thinner than in the Port Washington installation, because practically the entire radial distance is effective in dropping out the particles which, as we have shown is not the case in the Port Washington hydroseparator.



Sand sizer makes three divisions in size gradations at Portland, Ore., sand and gravel plant



Plan and elevation of Fahrenwald hydraulic separator with pockets (sorting columns' for eight sizes of sand



Diagrammatic sketch of sand sizer installation and its products at Portland, Ore., plant

Fine Sand Recovery

The underflow of the hydroseparator at the Port Washington plant goes to two rake classifiers (eventually to three), and by manipulation of the feed and rake speed, as much or as little of the fines recovered in the hydroseparator can be retained. This sand is evidently well graded in reference to the intermediate sizes, and with addition of grits at the coarse end and fines at the other end of the series, almost any sand specification can be met, according to report. We have no screen analysis so it is not known how close this sand would come to meeting the new Corps of Engineers' specification.

The other new plant we have in mind, on the West Coast, is that of the Pacific Building Materials Co., Portland, Ore., described by Mr. Lenhart in the October issue of ROCK PRODUCTS. Here four gradations of sand are put into bins, but two of these gradations represent blends of three separations each, and one is made up of a blend of two. Here, as in the Port Washington plant, the first stage in the processing of the sand, or fine aggregate, is to send it to a hydroseparator, 20 ft. in diameter. The feed is about 90 tons of sand and 300 tons (1200 g.p.m.) of water an hour. The dilution then, on the usual volume basis, is 0.45 cu. ft. of sand and 2.7 cu. ft. of water per sec., which is about 6:1. Fresh water is used in this instance.

As in the Port Washington plant, this Portland plant makes the coarse sand fraction (minus ¼-in. plus ⅛-in.) on wet vibrating screens. Only the minus ⅛-in. material is fed to the hydroseparator. The underflow of the hydroseparator is said to be 50 percent solids, and assuming a 90-t.p.h. sand recovery, with sand at 110 lb. per cu. ft., the 0.45 cu. ft. of sand per sec. would remove 0.45 cu. ft. of water per sec., leaving 2.25 cu. ft. to overflow the hydroseparator rim

(Continued on page 120)

Effects of Carbon Dioxide On Hydrated Cement and Concrete

Strength tests of specimens stored under conditions with and without CO_2 atmosphere compared. Formation of sodium or potassium silicate due to carbonation of hydrated cement may be factor in alkali—aggregate reaction

By S. L. MEYERS*

CARBON DIOXIDE is a small, but ever present and fairly constant constituent of the atmosphere. This gas is formed or given to the atmosphere by the combustion of fuels, the oxidation processes of metabolism and by the decomposition of carbonate minerals. Plant growth and the formation of mineral carbonates absorb carbon dioxide from the atmosphere.

Limes have been used as building materials since ancient times. Fat limes consisting almost entirely of calcium hydroxide harden mainly by the formation of calcium carbonate crystals, aided to a minor extent by the deposition of calcium hydroxide crystals, which separate on drying.‡ As the atmospheric carbon dioxide can only react with the surface of the lime first and then slowly diffuse its way towards the interior of the mass, the surface of limes, consisting of a carbonated envelope, is harder than its interior. This is true of some lime masonry work even after centuries of exposure to the air, as the inside of the mass will not be completely carbonated. While sand is primarily used in sand-lime mortars to reduce volume changes, it also aids the passage of carbon dioxide to the interior of the mass by increasing the porosity of the mortar, and indirectly aids the hardening of fat lime mortars.

Like lime, the surface of concrete exposed to the air will slowly carbonate, becoming stronger, harder and more impermeable. Considerable amounts of calcium hydroxide exist in cured concrete, having been split off from the calcium silicates in the cement during hydrolysis. Where carbon dioxide can get into contact with the lime hydrate the following reaction occurs: $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O +$ heat

Not only is crystalline limestone formed, but 580 calories of heat are liberated per gram of CaO involved in the reaction; and for each molecule of carbon dioxide absorbed one molecule of water (41 percent of the weight of CO_2) is liberated. If the water formed is removed and the concrete kept partly dry—in a state of lower relative humidity—the rate of carbonation proceeds more rapidly than in a water-saturated state[3]. G. E. Bessey[4] explains this condition as follows: "In a water-saturated atmosphere a skin of calcium carbonate is formed on the wet surface, preventing penetration of the carbon dioxide. With diminishing humidity the amount of water in the pores of the material is decreased; they are opened up allowing access of the gas to all parts of the specimen. Carbonation of materials, both in practice and in test specimens, is therefore to be anticipated more under dry than under wet conditions."

The rate of carbonation of calcareous cementing materials is also increased by the concentration of carbon dioxide in the air or enveloping gas,[5] and by the pressure on this gas, and by the porosity of the structure. Concrete exposed to grounds containing much carbon dioxide from decaying vegetable matter, and light-weight concrete containing porous aggregates would be expected to carbonate to a greater extent than the average concrete.

Strength tests comparing carbon dioxide storage and carbon dioxide-free storage on specimens of briquettes were made. The usual mold and water storage was employed to one week; then the "control" specimens were put into sealed containers containing a CO_2 absorbent so that no further carbonation would occur. The remainder of the specimens were placed in a strong gas-tight container. The air in the pore spaces of the specimens was removed by a vacuum to allow easy access of CO_2, which was then forced into the container at 50 p.s.i. and kept at that pressure for ten days. When the first tests were made, both the CO_2-treated and control specimens were broken in tension and compression, and the remainder of the CO_2-treated specimens were subjected to a further 15 days of CO_2 storage at 150 p.s.i.

Table 1 shows the comparative effect between control and CO_2 storage, on strength and on some chemical tests made to determine the extent of carbonation.

The "surface" samples contained surface material to a depth of $\frac{1}{8}$ in., while "center" samples represent about $\frac{1}{2}$-in. cubes taken from the center of the cube test pieces.

The center of a 2-in. cube test piece stored under 150 p.s.i. CO_2 is almost as completely carbonated as its surface. The 5.93 percent CO_2 in its center, the least carbonated part, is equivalent to 27.7 percent of the original dry cement, or enough CO_2 to carbonate 34.6 percent, or a little more than one-half of the lime contained in the original cement, and more than twice the calcium hydroxide which the cement can split off during complete hydration. This proves that the carbon dioxide did break up one or more of the calcium compounds in the hydrated cement, other than the calcium hydroxide, and did combine with the calcium of the compounds broken up.

The carbonated test pieces attained considerably higher strength than the control specimens stored in moist carbon dioxide-free air. They also had a higher modulus of elasticity and appeared to be much harder and more difficult to grind in a mortar.

Carbonation of Hydrated Cement Compounds

In order to determine how far this breaking up of the cement compounds by carbonation would proceed and to study its effects, powdered samples of the four principal cement compounds and one sample of cement,

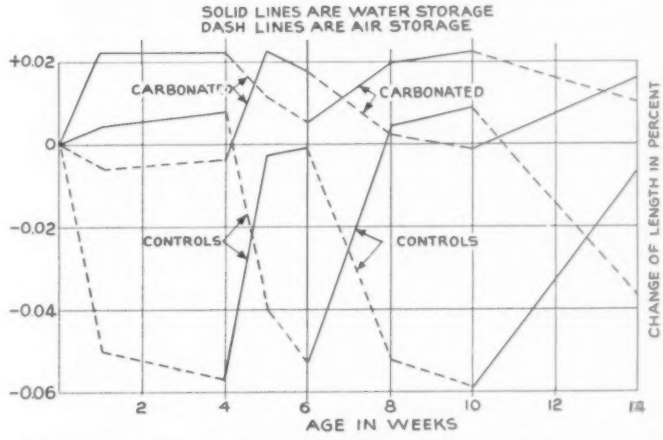
*Chief Chemist, Southwestern Portland Cement Co., El Paso, Texas

‡Some investigators believe that there is some combination between the lime hydroxide and the sand in mortars over very long periods of time. 1,2

all hydrated to as great an extent as seemed reasonably possible, were treated with CO_2 under pressure. The neat cement was in the shape of a thin wafer made by mixing the dry cement with 60 percent of its weight of water, mixing continuously to prevent bleeding until the paste started to harden, spreading the paste about 2mm. thick on wax paper and allowing it to hydrate before placing under 150 p.s.i. CO_2 in storage.

These samples, which were small amounts, were tested at intervals to note the progress of carbonation. At the end of ten weeks of CO_2 treatment in storage, carbonation was proceeding very slowly, and the samples were removed from CO_2 storage and analyzed chemically after drying at 210 deg. F. to remove any free moisture which might be present.

The cement paste hydrated with 60 percent of water carbonated more readily than any of the four hydrated cement compounds, although the tricalcium silicate approached its rate. The porous structure of the neat cement probably aided its carbonation. The rate of carbonation of the four cement compounds followed, somewhat, their rate of hydration; taking into consideration that in practice tricalcium aluminate is not the quickest compound to hydrate, because hydration is slowed up by surface-hydrated material retarding the entrance of water to the interior.



Change in volume of carbonated and control mortar bars during alternate air and water storage

Hydrated Cement Minerals and Hydrated Cement Paste Carbonated Under 150 p.s.i. CO_2

Compounds	Tetracalcium Aluminoferrite	Tricalcium Aluminate	Dicalcium Silicate	Tricalcium Silicate	Neat Cement
Carbon dioxide, (%)	12.78	14.63	14.17	30.60	29.32
Free lime, (%)	none	none	none	none	none
Total calcium oxide, (%)	32.80	39.10	50.20	45.90	40.00
Quantity of CaO carbonated, Extent of Carbonation	50%	50%	36%	84%	93%
Total silica, (%)			28.00	17.70	13.00
Acid insoluble silica as % of total silica			46.60	82.00	93.00

In the case of neat cement and the silicate compounds, the acid insoluble silica expressed as a percentage of the total silica present follows rather closely the extent of carbonation.

The probable reactions of carbonation of hydrated cement compounds are as follows:

(Hydrated tricalcium silicate)

$2CaO \cdot SiO_2 \cdot \times H_2O + Ca(OH)_2 + CO_2 \rightarrow CaCO_3 +$ hydrous SiO_2

(Hydrated dicalcium silicate)

$2CaO \cdot SiO_2 \cdot \times H_2O + CO_2 \rightarrow CaCO_3 +$ hydrous SiO_2

(Hydrated tricalcium aluminate)

$3CaO \cdot Al_2O_3 \cdot \times H_2O + CO_2 \rightarrow CaCO_3 +$ hydrous Al_2O_3

(Hydrated tetracalcium aluminoferrite)

$3CaO \cdot Al_2O_3 \cdot \times H_2O + CaO \cdot Fe_2O_3 \cdot \times H_2O + CO_2 \rightarrow CaCO_3 +$ hydrous $Al_2O_3 +$ hydrous Fe_2O_3

The hydrous silica set free in the first two of the above reactions is insoluble in dilute hydrochloric acid, but is soluble in a solution of sodium or potassium hydroxide. Anhydrous or hydrated portland cement, including its silica, is soluble in dilute hydrochloric acid, and all but a very small amount of silica will pass a filter paper into the filtrate from which the silica can be separated by baking or dehydrating to make the silica insoluble in dilute hydrochloric acid. The Florentin method of determining the cement content of concrete takes advantage of the fact that cement silica in concrete is soluble in dilute hydrochloric acid, and that the cement content can be calculated from the percentage of soluble silica obtained on analysis, taking into consideration the percentage of silica probably present in the cement used in the concrete.

But if the cement is carbonated, since much of it may be in very old, porous and lightweight concrete, or in the surface of even dense concrete or in cement stucco, a correction must be applied for the degree of carbonation. Steopoe[5] suggests that the hydrous acid-insoluble silica be given an additional caustic digestion and that this silica, now in a soluble form, be added to the acid soluble silica. This, however, runs the risk of possibly dissolving some amorphous silicates from the aggregate by the caustic digestion.

In the above reactions involving the carbonated iron and alumina compounds, it is assumed that hydrous iron and silica are formed, and that the carbonates if formed would not be stable. These hydrates (?) or hydrous oxides are soluble in dilute hydrochloric acid, but dessication slowly converts them into an acid, insoluble form.

Possible Effect on Alkali-Aggregate Reaction

The carbonation of hydrated cement resulting in the separation of amorphous silica soluble in caustic alkali solutions to form sodium or potassium silicate might contribute to the alkali-aggregate reaction. In fact, aggregate containing amorphous, or other deleterious silicates, might not be necessary for this reaction to occur where the cement furnishes the amorphous silica as well as the alkali to form alkali silicate, which under suitable conditions develops sufficient osmotic pressure to have a disrupting effect on concrete.

With some mineral aggregates (feldspars) carbon dioxide causes decomposition and separation of alkalies; in this case the alkali-aggregate reaction could occur without the cement.

Cementing Values Of Carbonated Materials

As the carbonation of portland cement concrete proceeds to that extent where the normal hydrated cementing agent-cement gel—is destroyed and replaced by crystalline calcium carbonate, the strength of the concrete increases as the amount of calcium carbonate increases. It appears that crystalline interlacing, or intercrystalline adhesion, can be a more powerful cementing agent than the colloidal glue that it displaces. It is also possible that the separated silica in

TABLE I

EFFECT OF CARBON DIOXIDE STORAGE ON 1 CEMENT: 3 SAND STORAGE

		Control, stored in carbon dioxide-free air		10 days in carbon dioxide at 50 p.s.i.		Further 15 days storage at 150 p.s.i.	
		Surface	Center	Surface	Center	Surface	Center
Carbon dioxide (%)		0.62	0.06	8.10	3.46	6.89	5.93
Ignition loss (%)		7.84	8.37	13.34	12.53	12.78	13.89
Free lime (%)		2.20	2.95	0.10	1.60	0.02	0.80
Acid insoluble (sand) (%)		68.67	66.72	61.30	63.85	64.11	65.12
P. cement content of mortars in terms of original cement (%)		23.89	25.31	25.76	24.02	23.51	21.41
Calculated to % weight of original cement	CO_2	2.59	0.24	31.44	14.40	29.31	27.70
	Free CaO	9.21	11.66	0.39	6.66	0.09	3.72
	$CaCO_3$	5.88	0.54	71.45	32.72	66.60	62.95
		(age 17-days)		(age 17-days)		(age 32 days)	
Compressive strength, p.s.i.		4225		6312		8425 (Control 4900)	
Tensile strength, 1c : 3s, p.s.i.		440		605		766 (Control 470)	
Modulus of Elasticity				4,800,000		5,500,000 (Control 3,800,000)	

All specimens stored one day in molds, then 6 days in water at 70 deg. F., then controls were placed in sealed moist storage in CO_2-free air. Specimens for CO_2 storage were placed in vacuum for 2 hr., then under CO_2 pressure.

After breaking test pieces, material at surface to ¼-in. depth taken for surface and material at center for center samples.

carbonated compounds might contribute some cementing value filling minute voids, increasing the density, and bridging voids to strengthen intermolecular forces of adhesion. Dense limestones, consisting almost entirely of crystalline material, commonly have compressive strengths over 10,000 p.s.i. and occasionally 30,000 p.s.i.

The broken one part cement: three parts sand briquettes, from which the tensile strength tests in Table 1 were obtained were used for some specific gravity and void determinations:

	Controls	Carbon Dioxide Storage
Specific gravity of ground briquette mortar by displacement in kerosene	2.55	2.63
Bulk sp. gr. by bulk displacement	2.24	2.34
Percent of voids in mortar, from increased wt. of kerosene absorbed in vacuum	12.4	11.8
Specific gravity of abs. solids (sand plus hydrated and carbonated cement)	2.55	2.65

These figures show that carbonation of hydrated cement-sand mortar reduces pore space and increases the density of the absolute solids. This effect would occur entirely in the cement paste, and the sand would undergo no change. Both of these conditions would favor increase of strength.

Brady[6], using 2.24 for the sp. gr. of calcium hydroxide and 2.71 for calcium carbonate, has calculated that in the carbonation of crystalline hydroxide to calcite there should be a linear expansion of 0.053 percent. Actual experiments proved that carbonation resulted in a slight shrinkage instead. The crazing often found in the surface of concrete products, even though the concrete is well made, dense and of low water-cement ratio, is believed to be caused more by carbonation than by air-drying-shrinkage.

The effect of partial carbonation on the specific gravity of hydrated cement compounds is shown below:

	Tetracalcium Aluminoferrite	Tricalcium Aluminate	Dicalcium Silicate	Tricalcium Silicate
Hydrated	2.81	2.55	2.81	2.45
Carbonated	2.87	2.59	2.84	2.61
Extent of carbonation	50%	50%	88%	84%

Large volume changes occurring in conditions of varying humidity are characteristic of colloidal cementing materials such as cement gel. If some of the cement gel is replaced by a substance having a crystalline structure, as was noted by Lerch[7] in cements of high sulphur trioxide content capable of forming large amounts of crystalline calcium sulphoaluminate, there is a reduction in the magnitude of these hygrol volume changes. Since the crystalline calcite ($CaCO_3$), formed during the carbonation of cement, replaces some or all of the cement gel, this should be effective in reducing the magnitude of these changes proportional to the extent of change from colloidal to a crystalline structure.

Bars for volume change tests were molded from mortars consisting of one part of cement to four parts of 20-30 Ottawa sand. They were given the same preliminary curing and 150 p.s.i. CO_2 storage treatment as previously described for strength tests, except the 150 p.s.i. CO_2 storage was extended for one month. Then one-half of the carbonated bars were stored in water and the other half stored in the dry air of the laboratory. The same procedure was duplicated with the controls. At the end of one or more weeks the storage conditions of all groups were reversed. The results are shown graphically.

The volume changes of the carbonated bars were, in most cases, only 30 percent to 40 percent of those of the controls or uncarbonated specimens, indicating that the crystalline structure in the carbonated specimens did have the expected result of diminishing volume changes in wet and dry storage.

In a vacuum at a certain low water vapor pressure, substances will adsorb a surface layer of water one molecule thick. Powers and Brownyard[8] have shown that the weight of this adsorbed water is proportional to the surface area present. It is known that colloidal gels have enormous surface areas while those of crystalline materials are far smaller; a comparison, then, of adsorbed water under suitable conditions is indicative of their comparative colloidal content. Samples of hydrated and carbonated neat cements were placed in a vacuum over magnesium perchlorate having a very low vapor pressure, the loss in weight noted, then they were returned to the vacuum over copper sulphate, $CuSO_4 5H_2O$, with a vapor pressure of about 8 m.m. of mercury, to constant weight.

Change in weight in a vacuum under different vapor pressures was:

	Hydrated Neat Cement	Carbonated Neat Cement
Loss of weight over magnesium perchlorate	14.78%	6.00%
Gain in weight over copper sulphate	5.01%	2.45%

This experiment also indicates that carbonated cement contains less colloidal material than hydrated cement.

Carbonation appears to reduce undesirable volume changes and enhances the desirable properties of hardness, strength and impermeability. Where concrete products manufacturers have a cheap source of carbon dioxide, such as gases from a lime kiln or waste combustion gases from boilers making steam for curing concrete, there is some possibility that carbonation after an initial hydration period might have some advantages.

Summary

Carbonation of concrete increases strength and reduces volume changes and permeability.

Carbonation of hydrated cement compounds proceeds further than merely changing the liberated calcium hydroxide to calcium carbonate, but does decompose each of the four major compounds to limestone and hydrous silica, or, hydrous alumina or hydrous iron.

The silica made insoluble in hydrochloric acid by carbonation is roughly proportional to the extent of carbonation of the hydrated cement or cement silicate compounds. This separated silica is in an amorphous form capable of combining with alkalies and might contribute to the alkali-aggregate reaction.

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(7) Wm. Lerch, **A.S.T.M. Proc.** Vol. 46, 1946, p1252

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Coast to Coast

A novel belt-conveyor stockpiler in use at the aggregate plant for construction of Davis dam on the Coloredo river. This dam is located about halfway between Hoover and Parker dams

100 Weeks of Editorial Travel

An editor comments on developments and trends in the rock products industries as observed in thousands of miles of travel.

By WALTER B. LENHART

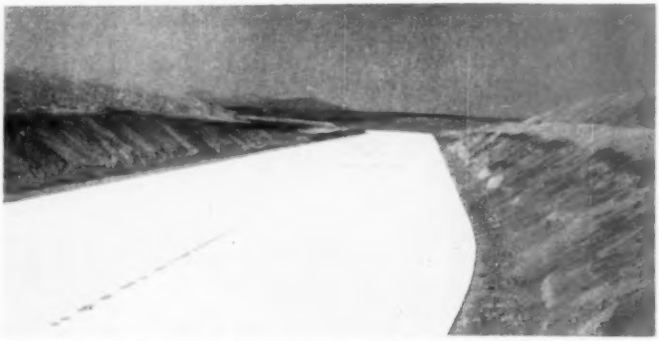
LATE THIS Fall, the writer completed 100 weeks of continuous travel throughout the United States. With a few exceptions, the travel was all by automobile during which time practically every state in the union was touched upon, and without doing a lot of research we have no idea the many thousands of miles travelled, but without question, the mileage involved far outdistanced similar travels by any one editor for any trade publication. During that period we visited the Pacific Coast twice. That area has been productive of great development in plant expansion since the war, since the west continues to expand and its construction requirements have been proportionately heavy. Each of these trips on the Coast took up several months of travel alone. The area between the Mexican Border to the Canadian line was traversed no less than six times, and this does not count one trip from Los Angeles to San Francisco, to Nevada points and back to Los Angeles. The balance of the time was spent in the East, the New England states—two trips into Florida—Texas, and that area we have come to refer to as "The South."

Travelling in this manner gives one a picture of things in our industry as a whole. Most of us live in worlds of our own; our world overlaps with that of our neighbors but does not coincide with it. The forces within each of these individual circles control the action of the individuals there and it is difficult at times to see why our neighbor and friend thinks and acts as he does.

Localized travel, or travel confined to a specified segment of the United States, may give one more detailed information on that particular circle, and the opinions formed therefrom may center on local problems, but on centering on these tributary streams we may lose sight of the main river whose slightest change can affect us all. For instance, we have seen sand and gravel producers point with pride to a new shovel, or dragline, or new plant. These seemed to be the center of his life and the climax of a successful career. While over in a distant state, or section, and totally unknown to him, changes were being made in the chemical and mineralogical specifications of his plant's output, which if carried to the conclusion indicated by the new trend, would put him out of business, possibly completely and forever.

During the two years of travel, business in all points visited was at boom stages. Portland cement plant operation could be used as the gauge, and without exception, all such plants

visited were working at top capacity, silos were empty, and many of them were wondering where all the material was going. Some were thinking of the boom periods of 1927-28 and part of 1929 and wondering if the present could be following a similar pattern, but by far the greater majority of producers felt that the rock products industry was in for at least two more years of extreme activity and maybe five years. They not only voiced the opinion but it was apparent that they were backing up their beliefs by spending vast sums of money on new plants where none existed before, on new plants to replace older and outmoded ones, and to re-vamp plants that were, in many cases, built only a few short years ago. Living expenses, as judged solely from hotel and dining room service practically doubled during that period; but by comparison, the basic industries, as represented by the rock products industry's sales prices, have remained practically static. There was some upward trend in the selling price of our industry's products, but compared to other commodities, the increase was infinitesimal. The rock industries have had to look to more efficient operations, larger output per man hour, savings in fuel and saving in power for continued profitable operation. Estimates as to capital costs of new plants throughout the nation—well, try and get one. No one wants to stick his neck out, for most of the companies we contacted and which built plants the past two years found their estimates of costs of new plants so far out of line (and on the low side), that in some instances it amounted to financial embarrassment to the builder.



A concrete canal on an irrigation project in the west. This construction job started in the late 1930's and is still being pressed to completion

Resources and Progress

One making such a trip cannot help but be impressed with the enormous resources of our country and the progress that has been made over the years. But by comparing the progress in one state as against that in other more distant areas, one finds room for a lot of future development work. This type of development work, looking at it in its broadest scope, is moving the centers of population and the centers of industry further west and possibly a little more to the south. The West and the South have been working under adverse freight rate conditions. Possibly a traffic expert could give a better picture as to the easements, if any, that have changed that picture during the past two years. But in the West, we do know that three steel mills are operating and expanding. Basic industries in practically all fields are shifting west and south.

The West Coast, for instance, during the last war, built huge steel fabricating plants, shipyards, etc. Many times we saw major pieces of equipment going into cement plants, rock plants, etc. that had easily-read signs on them that said in essence, "Manufactured for an Eastern Company by a Western Fabricator." And conversely, we learned of several West Coast equipment manufacturers who plan to have their items manufactured in the East, and do not overlook the fact that there is a lot of inventive ability in the far West.

Reported to be one of the largest draglines in operation in the rock products industries, this large machine marks a trend towards larger and larger units for excavation, haulage and processing evident throughout the industry

Pioneering West

It has been our observation that the struggle for existence in the West is a little more keen than in the Midwest or the East. It has always been thus with the pioneer. The harder the competition, the greater the struggle, the more resourceful the people, and resourceful people conjure up ideas that at first appear fantastic, but as the years roll on the ideas do not appear so far afield after all. When we first heard of the plan to take water out of the Columbia river and spread it out over the dry areas of eastern Oregon, eastern Washington, down into California and possibly parts of Nevada it sounded like the "big dream." But it's not a big dream—they have even selected the approximate site of just where the water will leave the great river of the Northwest on its journey into California. People who can carry through these vast projects can and do develop processes and

This shot was taken during erection of a large sand and gravel plant on the west coast that will cover between 30 and 40 acres and features seven intermediate surge piles in the flow

equipment; they can manufacture them and sell them, and instead of all equipment moving west, some will be moving east.

Our country is so large, its industries so diversified, and the changes within it so numerous that it is with difficulty that we keep pace with the activities that are doing their part to make history. Our rock products industry is a part of the whole and developments in one industry affect all industry, directly or indirectly. We could point to a development in the cracking of oil that was essentially the parent of the fluo-solids technique for burning lime; of the development of the lance-flame method of drilling that originated in the huge taconite iron ore work in progress on the iron range of Michigan and Minnesota, and of how this lance-flame technique is being used in several of our quarries; one a hard quartzite, another a dolomite. Other operators are investigating its possibilities.

Population Trends

Our industry is one to be proud of. It is big, it is healthy, it is growing, and it is interesting. But we must be mindful of the changes going on about it, and of the basic requirements that keep it going. About two years ago our attention was called to an article by an eminent writer, and since then his theme has been taken up by various branches of the press and that theme related to the population of the earth and the number of acres it took to feed that population. At that time there were 1.7 acres per person and 2.5 acres were required to feed that person properly. Someone is going hungry and no 'ism can change this basic fact. We are all more or less dazzled by the vast scope of industry and its richness, but when the number of agricultural acres in the United States are less than 2.5 per person, then we are in for trouble. A calculation will show that trouble from this source in the United States is many years away. Nevertheless, we should realize that our population increased an estimated 14,444,000 in the last eight years. It will require 580,000 acres of productive ground to feed this many people. Besides feeding them, they must have opportunities to earn their living. On the basis of five to a family, this requires 2,888,000 homes—and all since one year before Pearl Harbor. With the initial drainage of portland cement for such projects as the three atomic energy production centers, multitudes of huge dams, air strips, guided-missile projects, highway programs—when these large drains are added to building to make up for the stopping of many types of building during the war years, the destruction by fire, and old age—add them all up and there is no mystery as to where portland cement is going, nor any doubt as to the need for continued high production for several years to come.

Travel brings home many important facts in striking manner. We read with only casual interest of such things as the infant oil shale industry. But when one sees at Rifle, Colo., the work that is being done there by the United States Bureau of Mines cooperatively with the oil industry, it is not hard to see that here someday may be a rock industry, that in tonnage will surpass anything we ever dreamed of. When one sees these high plateaus all of oil shale that rise thousands of feet above the valley floor and cover areas that are vast, even on Western standards — the shales literally blanket areas as large as states — he cannot help but feel that here is a fuel that may someday change all industry. Or, when in the course of travels one sees coal resources in Wyoming and Utah that stagger the imagination, and new oil fields that seem to spring up overnight with enormous natural gas production, it's all a symbol of change.

Construction Projects

We may read in the papers of the signing of the pact by five states that make up the Upper Colorado river basin, and its significance is only of passing interest. Or, we read of the huge developments that are projected for the Colorado river, the Columbia, the Snake, the Willamette, the Missouri, not to mention the innumerable ones throughout the South and East. On the Colorado river alone there are some 134 projects involving an estimated expenditure of $2,185,442,000. Some 2,656,230 acres of ground will be irrigated and almost 20 billion kilowatt-hours of electrical energy will be developed annually. The Columbia river project comprehends 238 projects that will irrigate 5,360,000 acres of land, will involve some $5,598,494,000 and will produce 64.9 billion kw.h. annually. On the Missouri river similar large scale projects are in the making which include as a part of the plan some 105 dams and reservoirs that will irrigate 5,200,000 acres of land and supply 10 billion kw.h. annually. We do not have the estimated cost of this latter project at our finger tips but one dam alone involves 60,000,000 cu. yd. of excavation, plus 30,000,000 cu. yd. of fill, plus 1,730,000 cu. yd. of concrete. These are all big figures—just how much is 60,000,000 cu. yd.? Well, if you dug a trench 60 ft. wide, or about the width of a street and 12 feet deep and 430 *miles* long, the yardage would be close enough to give an idea of the scope of the work. The new irrigated land alone totals over 13 million acres or 20,650 square miles.

Dumping quarry rock to the primary crusher at a large granite operation in North Carolina

These projects and hundreds of smaller ones will help feed future generations. Each dam usually means a new aggregate plant and new batching facilities, and the new communities that spring up have to be supplied.

But don't worry about the expenditures too much. The projects are all self-liquidating and will create wealth for generations to come. It is important also to remember that a lot of this new land will be in areas where climatic conditions are such that several crops can be raised per year. Incidentally, California, in 1947 produced 2.2 billion dollars worth of agricultural wealth alone.

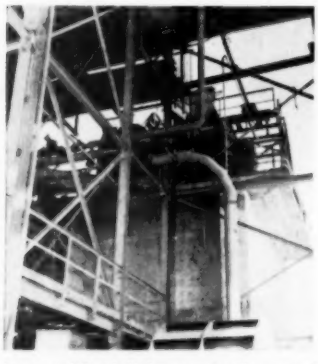
Total Number of Large Public Works Under-Way or Projected

We asked an engineer with one of the governmental agencies connected with these projects as to the number of such projects going on throughout the entire United States—not just what was in the West—and he answered about as follows:

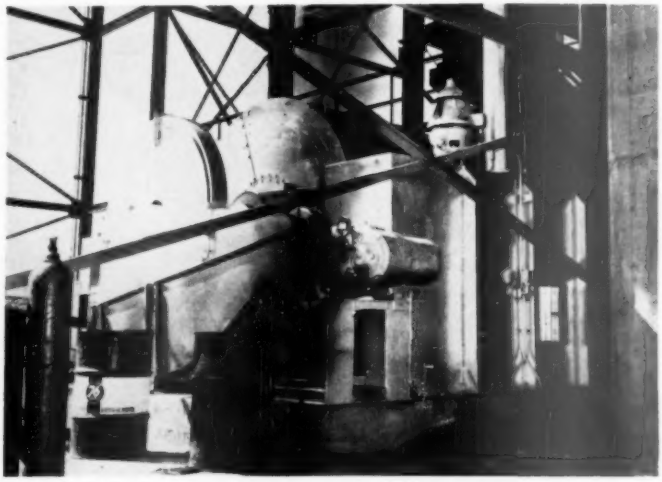
> "The projects should be divided up in several groups. First there are those projects actually under construction; secondly, those projects for which Congress has voted funds but work not as yet actually started; thirdly, those on which Congressional action is pending; fourthly, those proposed, those possible, and those in the nebulous stage. I don't believe there is one man in the United States today who has a clear mental picture of the entire program."

Someday we hope to delve into the subject more fully. Our travels have rounded up about a suitcase full of notes, data, pamphlets, etc. that would have to be sifted.

Do not get the impression that all the activity is in the West or Inter-Mountain areas. We have, as an illustration, an item before us that states that the highway needs for the state of Illinois alone amount to some $5,500,000,000. Another state mentions building 284 miles of highway at a cost of $34 million dollars. That's almost $120,000 per mile.



Large peripheral-discharge rod mill mounted on massive concrete structure for the manufacture of sand from pea gravel



Revolutionary type of sand recovery unit catches sand in the bottom of collecting cups

We must not be un-mindful that while our rock products industries are growing, others are dying, and in their decreased activity they are directly and indirectly affecting the rock producer. One industry that is losing faster than most want to admit is the lumber industry. Logs are now going to the saw mills that 20 years ago would have been considered worthless—crooked, knotty, and about the size of a conventional railroad tie. When an industry is that hard pressed for raw materials it's time to think about substitutes.

Non-Ferrous Metal Mining

Another major industry that is declining in the United States is the non-ferrous metal mining industry. Copper, lead, zinc, tungsten and other so-called minor metals are being depleted at a rapid rate. There has not been an important discovery in the copper mining industry since the early 30's. The mines that account for our production are being worked to the hilt and someday, not far off either, these mines will be gone. As an example, Utah has kept up her copper production but it's mostly from one mine. As other producers fade from the picture, this one company seems to step in and take up the slack. Once a worker starts to work in the mines or the timber, he starts to work himself out of a job. But don't be too smug for some of the plants in our rock industries are getting in the same class.

Many are inclined to think that limestone deposits, sand and gravel, and many other rock products have an infinitely long life. It is true that gravel is gravel, and sand is sand, but changes in specifications, particularly changes that revolve about the chemical composition of the aggregate, are limiting the extent of deposits. In one state a valley was being worked by a sand and gravel producer over an area measurable in miles. Apparently work had started and stopped at several locations, and on inquiry it developed that most of the areas abandoned contained too much "reactive aggregates." Another operator worked a deposit for years that had a thin bed of clay. As time went on and the pit lines expanded, the clay seam became wedge-shaped and the pit had to be abandoned; a new one was opened up a mile or more away. The composition of limestone varies within limited areas and when some components are assayed in terms of a fraction of a percent, a slight rise in the content of some part of the limestone has caused the stone to be rejected for many uses. In several other cases we saw stripping operations that were becoming so burdensome that it will only be a question of time until the plant and deposit will have to be abandoned.

Some may say: "well, open up a new pit in some new locality." But the growth of most communities has spread over so much of the country that opening a new pit might mean a law-suit. Even re-opening a pit that has been idle a few years may result in a legal battle. No, our rock deposits have measurable lives, but many can and will be salvaged through beneficiation and improved equipment.

An extended trip like this one gives the traveller an opportunity to judge, in a general way, and to compare

(Continued on page 110)

PRODUCTION PROBLEMS In Mineral Wool

Technological problems to be answered in regard to raw materials, furnace types, grading and marketing, if industry is to meet present competitive situation

By JOSEPH S. TANTILLO*

THE RAPID GROWTH of the mineral wool industry in the past decade has created a highly competitive situation despite the fact that manufacturing has endeavored to keep pace with improvements. Increased familiarity of the purchasing public with the potentialities of the product has initiated inquiry into new technical possibilities and applicability. This, in turn, has accelerated demand to satisfy certain specific conditions. The older manufacturers have recognized this and are meeting it by instigating technical study of their products and processes with the object of standardization or improvement.

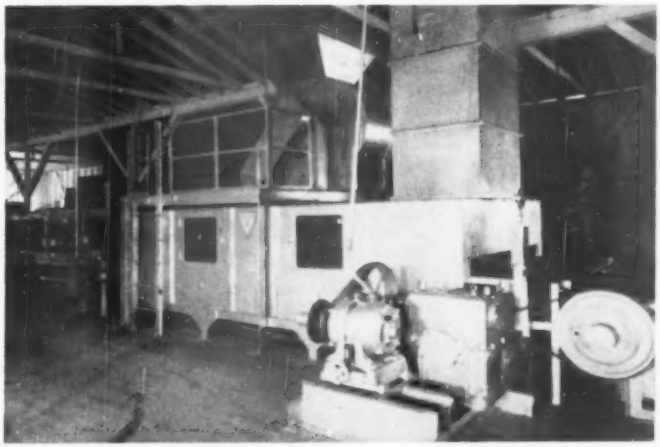
Research and Raw Materials

Items in the manufacturing process that require careful technical study and control by an established producer and that hold potential trouble for the prospective producer are: (1) chemical and physical composition of raw material; (2) type of melting furnace; (3) melting and blowing temperature; (4) blowing technique; (5) shot prevention or removal; (6) consumer's specification requirements.

A great many materials are used in the manufacture of mineral wool, among them being the natural wool rock of Indiana, classed as a calcareous shale or argillaceous limestone, common shale, clay, combinations of clacareous and siliceous materials, including waste glass and china, and iron, copper, and blast furnace slags.

Unconsolidated fine materials cannot be used in water-jacketed cupolas because of the difficulty of forcing a draft through them. This confines the selection of raw materials to products large enough in size to permit free passage of furnace gases. It is necessary that the material retain its shape to the melting point size.

*Whiting Corp., Harvey, Ill.



Batt Production line, right, and oven, center, in modern rock wool plant, illustrating variable-speed drive which is a refinement to lend flexibility

A study of the chemical composition of raw materials used in individual plants show great variety. Some operators attempt to achieve and maintain a chemical balance between acids and bases in the cupola charge. Others contend that this is not necessary and that better wool is obtained when there is a definitely greater percentage of acids than bases or vice versa.

Type of Melting Furnace

By far the largest portion of present production is made in water-jacketed cupolas. One manufacturer has been successful in briquetting fine unconsolidated materials and melting them in cupolas, and one operator is using a conical cupola instead of the cylindrical type that has become more or less standard.

Recently, the reverberatory-type furnace with oil fuel has been used successfully. This equipment permits the use of finely divided unconsolidated materials, since it is not necessary that furnace gases pass through them.

It is evident that the type of melting furnace that will be used in the future is still a matter of scientific research, experiment, and evolution. Possibly none of the present types of equipment will be the ultimate standard. The proper operation of either the old or a new type, however, requires expert knowledge and cannot be left safely to inexperienced operators.

Melting and Blowing Temperatures

Both melting and blowing temperatures are important factors in wool manufacture. With the same raw materials or chemical composition of furnace charge and with all other factors remaining constant, a change of melting or blowing temperature, or both, will produce wool of considerably different physical characteristics, such as shot content, fiber diameter, fiber length, etc. All of

these have a definite bearing on the economic problem.

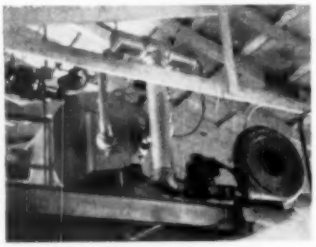
Melting and blowing temperatures have a definite effect on the viscosity of the slag. Chemical composition also affects viscosity. Apparently slag viscosity is an important factor in shearing action of the steam or air jet and its ability to produce a fine or coarse fiber and a minimum or maximum of shot. Since viscosity depends on composition as well as temperature, it is conceivable that two slags may have the same viscosity and yet be widely different in composition.

A study of the blowing temperatures in plant operations shows the wide variations in actual use. It is plain that different temperatures would be necessary with different ingredients in the charge, but examination will show wide variation in temperature with similar raw materials.

Undoubtedly, adequate study would discover the reasons for these anomalies, and they may even be apparent to the blast-furnace technician; they are emphasized herein to show the necessity for adequate technical control of plant operation and possible causes for failure by the inexperienced.

Customers' Specification Requirements

A few large consumers have demanded a product that will meet their particular specifications. These,

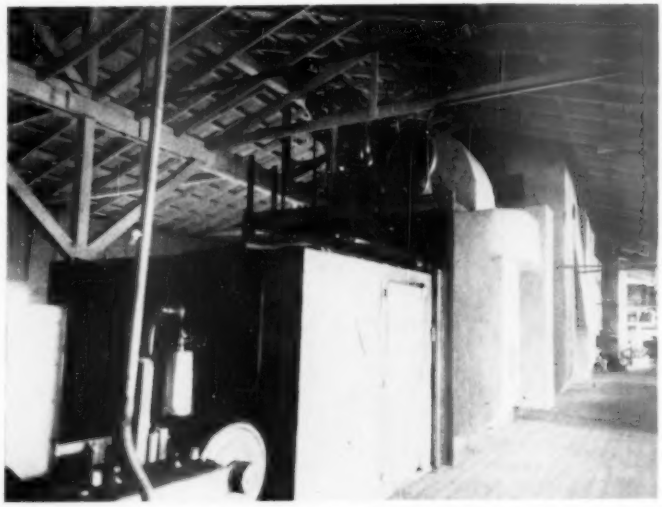


Automatic gas controls located at firing end of oven in up-to-date mineral wool plant represents latest practice for setting binder

in some instances, are a matter of contract between buyer and seller and have not been made public. Specifications of different buyers do not agree, probably because the material is used for different purposes.

At present, while the demand for specification wool is increasing, no standard specifications have been evolved. Illustrative of the trend of specification requirements is the following: (1) Chemical composition; (2) shot content; (3) fiber size (diameter and length); (4) ductility or softness; (5) waterproofing; (6) thermal conductivity.

Fiber Size: Mineral wool is being manufactured in various fiber diameters and lengths. Theoretically, the



Batt production line, with gas controls upper center and oven, foreground, in ultra-modern plant of Tex-Ark Rock Wool Corp.

smaller the diameter of the fiber, the greater will be the number of confined air spaces, and hence the greater the insulating value. For mechanical and other reasons, it is not practicable to manufacture wool 100 percent of which has a minimum diameter. The lower and upper limits of fiber diameter for practicable or specific purposes have not been determined as yet.

The importance of fiber length also has not been established definitely. When raw wool is manufactured free of shot, fiber length will be of value as a supporting bond in retaining shape in place.

Ductility: Ductility or softness of wool is a factor for which no standards have been set as yet. Possibly "ductility" is not quite the proper term to use. The quality referred to is a combination of tensile strength and compressibility. Perhaps "resilience" would be a better term. Some wools are soft to touch while others are decidedly harsh. Presumably, this depends on fiber diameter as much as brittleness of the fiber. A soft wool is easier to handle and form to shape, whereas a harsh wool once formed may retain the shape better. As placed in the walls of buildings, the wool nearest the bottom is subjected to greater weight, due to compression, than that near the top of the wall. The fibers should be strong enough to support this weight without sagging, and yet the wool should be soft enough for easy handling.

Waterproofing: Some consumers demand that the wool be waterproofed. This does not refer to the paraffin oil used in manufacture, the purpose of which is to keep down dust in handling.

The reason for the demand for waterproofed wool apparently originated from complaints of condensation in the walls of insulated houses. Occasionally the house showed evidence of condensation within the walls after having been insulated, whereas previously there had been no such trouble. This led to the erroneous belief that mineral wool absorbed and retained moisture in the walls. From this belief sprang the demand for wool adequately treated to prevent absorption of moisture, hence the process of waterproofing. Careful studies have shown the causes and preventatives for condensation in the interior walls, and whether the wool was waterproofed or not made no difference. Condensation in wall interiors was found to be a result of improper wall construction, irrespective of whether or not insulation was used.

Thermal Conductivity: The conductance of mineral wool varies with the overall density of the material. As the density increases, the conductivity decreases to a minimum because of a decrease in size of the air pockets. Further increase in overall density causes an increase in conductivity, the limit of which is the conductivity of the solid material.

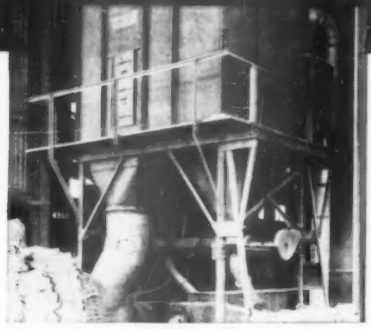
Phrased differently, this means that the insulating value of mineral wool increases with an increase in density to a certain point, beyond which the insulating value decreases with further increase in density. It would seem that this critical density point is in the neighborhood of 10 to 15 lb. per cubic foot.

Mineral Wool Dust

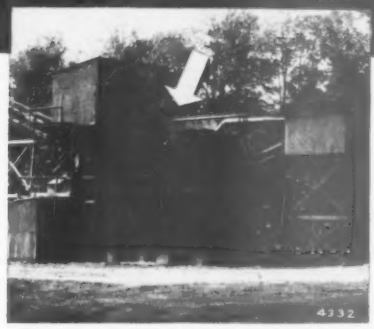
Some manufacturers do not oil their wool, stating that consumers prefer it dry. In dry wool plants there is a

(Continued on page 117)

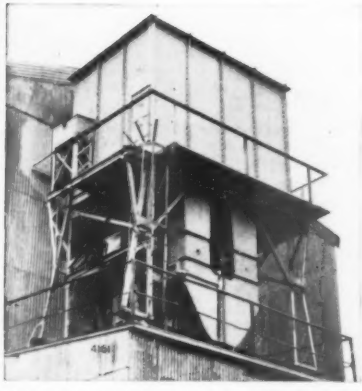
SLY PIONEERS AND LEADERS IN DUST CONTROL



Sly Dust Filter in a Cement Plant Bag House.



Sly Dust Filter in a Feldspar Quarry and Mill.



Continuous Sly Dust Filter on a Cement Plant Finish Mill.

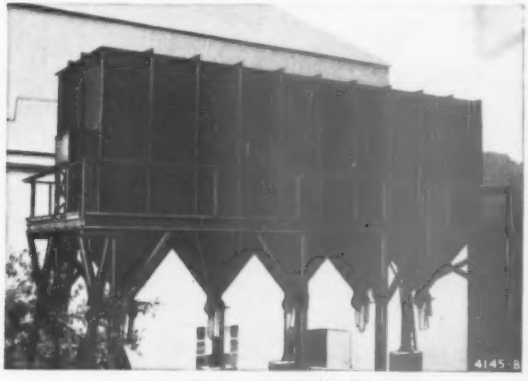
Many years of experience and numerous operating installations **IN YOUR PARTICULAR INDUSTRY** mak ly ne outstanding organization to engineer your dust problem.

A note from you will bring you our text book bulletin or, if you wish, a Sly engineer to help lay out and specify suitable equipment.

Sly units are not expensive; they save thousands of dollars yearly in plant maintenance and improved production.

One of several Sly Dust Filters on a Cement Plant Pack House.

Sly Dust Filter connected with the Crushing Plant of a manufacturer of roofing granules.



Sly Dust Filter in a Rock Crushing Plant.

Missouri Limestone Producers Meeting

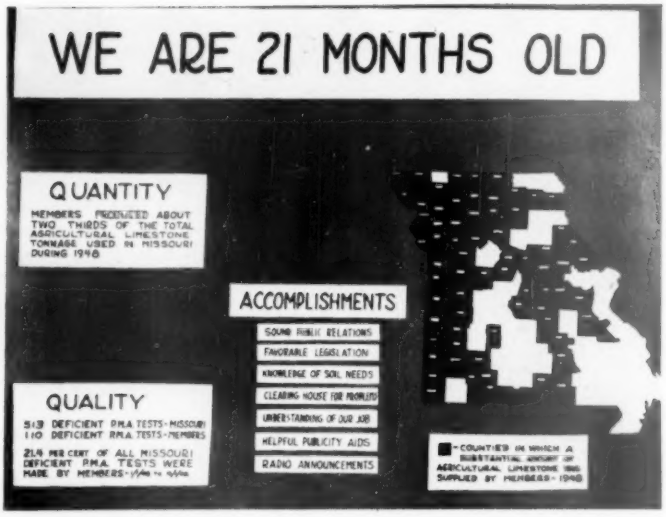
SECOND ANNUAL conference of the Missouri Limestone Producers Association was held December 3-4, Hotel Governor, Jefferson City, Mo., with about 130 regular and associate members in attendance. Highlights of conference sessions were talks by Robert M. Koch, secretary, National Agricultural Limestone Association, Washington D. C.; Fred V. Reagel, chief, Materials and Testing Section, Missouri State Highway Department; John W. Hendren, of the legal firm Hendron and Andrae, Association attorneys; and a panel discussion participated in by men representing five state and Federal agencies.

Conservation Program

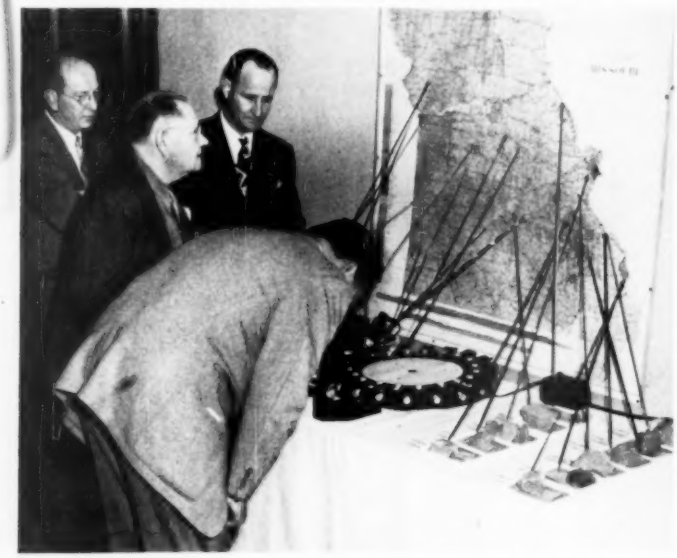
MR. KOCH pointed out that the future of the Federal Farm Program had taken on a brighter color since November 2 as a result of the national election. He discussed his reasons for believing agricultural limestone would be used in much larger amounts in 1949 than during the year just ended.

MR. REAGEL discussed aggregate problems of the Missouri State Highway Department. He stated that construction of new highways and roads in Missouri and the maintenance of present installations will require increased amounts of crushed stone aggregates in the next few years. He pointed out reasons why high quality of product and fair prices must prevail throughout the rock products industry: inferior materials will be ruled out by the highway department, not only because of their resultant deleterious effects but also because adequate high-quality stone deposits are accessible in nearly every area in the state. He stated his firm belief that no producer should erect his plant in a location where the raw material is substandard.

MR. HENDREN discussed legal aspects of the limestone industry and emphasized significance of Federal wage and hour legislation. He admonished producers to get their payroll structures organized to fit all requirements set up by law. Mr. Hendren stated that the turn of the recent national election shows a general trend toward further liberalization of national labor legislation and not curtailment of labor advantages.


WE ARE 21 MONTHS OLD
QUANTITY
MEMBERS PRODUCED ABOUT TWO THIRDS OF THE TOTAL AGRICULTURAL LIMESTONE TONNAGE USED IN MISSOURI DURING 1948
ACCOMPLISHMENTS
SOUND PUBLIC RELATIONS
FAVORABLE LEGISLATION
KNOWLEDGE OF SOIL NEEDS
CLEARING HOUSE FOR PROBLEMS
UNDERSTANDING OF OUR JOB
HELPFUL PUBLICITY AIDS
RADIO ANNOUNCEMENTS
QUALITY
5.3 DEFICIENT PMA TESTS - MISSOURI
1.0 DEFICIENT PMA TESTS - MEMBERS
21.5 PER CENT OF ALL MISSOURI DEFICIENT PMA TESTS WERE MADE BY MEMBERS - 1/46 to 6/48
COUNTIES IN WHICH A SUBSTANTIAL AMOUNT OF AGRICULTURAL LIMESTONE WAS SUPPLIED BY MEMBERS - 1948

Size and services of the group are shown by this poster exhibited at a recent meeting



Missouri Geological Survey exhibits showing locations of limestone and dolomites in the state. Left to right: R. O. Schoeffer, editor, Mississippi Valley contractor, St. Louis; Al W. Harris, equipment distributor, St. Louis; J. J. Griesemer, 1949 president of the association, Billings; and Paul N. Doll, Jefferson City, looking through microscope

Panel Discussion

Participants of the panel discussion were: Dr. E. L. Clark, Missouri State Geologist; J. A. Bergland, head, Safety Division, Missouri State Highway Patrol; Hon. Tom R. Douglass, Missouri Commissioner of Agriculture; John C. Kendrick, Material Division, Missouri Production and Marketing Administration; and John N. Falloon, Extension Specialist in Soils, University of Missouri.

Each speaker on the panel described the connection of his group with the limestone industry. Questions and answers followed and producers left the meeting with a much clearer understanding of their responsibilities to these agencies and the values to be derived therefrom.

One session was a joint discussion between producers and machinery dealers. General agreement was reached by all persons that a "code of ethics" was necessary by which producers and machinery firms could cooperate more thoroughly. It was pointed out that the general goal of both groups was mutual high production.

Significant in this joint meeting was the expression that machinery firms should give continued cognizance to the economies of locating new plants or expansions of present plants.

(Continued on page 108)

"Here's how I improved my plant conditions and *profited* too!"
These are words we often hear from cement manufacturers. They report that installations of St. Regis 150-FC Packers (plus St. Regis* Multiwalls) give them a cleaner, healthier plant, and help them do a *more economical* packaging job.
The 150-FC features a "delayed discharge" system which permits the trapped air to escape from the bag through a ventilator which surrounds the filling tube.
This contribution to more efficient packing improves plant working conditions by reducing dust . . . means a more saleable, better looking package . . . results in more accurate weight.
Your St. Regis sales or service representative will be glad to go into greater detail.
SALES SUBSIDIARY OF ST. REGIS PAPER COMPANY
ST. REGIS SALES CORPORATION
230 PARK AVENUE • NEW YORK 17, N. Y.
NEW YORK • CHICAGO • BALTIMORE • SAN FRANCISCO • ALLENTOWN • OFFICES IN PRINCIPAL CITIES
IN CANADA: ST. REGIS PAPER CO. (CAN.) LTD., MONTREAL • HAMILTON • VANCOUVER
ST. REGIS—WORLD'S LARGEST MANUFACTURER OF MULTIWALL PAPER BAGS
*Reg. U. S. Pat. Off.
St. Regis
VALVE BAGS
+ MULTIWALL =
BETTER PACKAGING AT LOWER COST
ST. REGIS PACKAGING SYSTEMS

(Continued from page 106)

Emphasis was placed on the fact that no good ever results from a badly located or over-expanded production plant which experiences financial disaster and that these disasters should be held to a minimum.

About 15 machinery firms, associate members of the Association, installed display space for their exhibits. The state highway department had a comprehensive exhibit showing good and bad crushed stone aggregates which commanded much interest and attention from producers and equipment men. An exhibit of particular significance to producers was displayed by the Missouri Geological Survey. This exhibit showed locations of various limestones and dolomites throughout Missouri and their desirable and undesirable trace elements.

Association Business

The association manager, PAUL N. DOLL, reported that the organization was 21 months old, having been organized March 1, 1947. Since that time it has grown to the point where its members produce about 70 percent of Missouri's agricultural limestone and those members produce only 20 per cent of the total inferior P.M.A. material, according to official government tests. Mr. Doll stressed the importance of increased publicity for limestone products, primarily through the media of radio, newspapers and periodicals. He stated that publicity should be channelled to two different groups: one type of publicity should be directed to customers or farmers and another type should be directed toward the general public, advising them of the values of agricultural limestone. He reported further that the association had prepared and sold to its members about 400 newspaper mats, 1300 truck and office decals and 18,000 folders. He stated that 16 members were using association radio scripts regularly on their radio programs.

Three new board members were elected to fill the vacancies created by as many retiring board members. New board members are: Ed Markwell, Auxvasse Stone and Gravel Co., St. Louis; George M. Baker, Lockwood; and Kenneth Kilkenny, West Plains. Retiring board members are: Oliver L. Taetz, Gray Summit; Ben P. Donnell, Valley Dolomite Corp., St. Louis; and L. H. Bray, Rolla. Other members of the board of directors who will serve during 1949 are: J. J. Griesemer, Bilings; C. E. Thomson, Dietz Hill Development Co., Kansas City; Arthur R. Alvis, Butler; L. W. Hayes, Kansas City; Merl Hamill, Canton; and Ray Howerton, Ashley.

Newly elected officers are: J. J. Griesemer, president; C. E. Thomson, vice president; Arthur R. Alvis, secretary-treasurer; and Paul N. Doll, manager. The legal firm, Hendren and Andrae, was retained.

Left to right at the speakers table at the banquet held for the annual meeting of the Missouri Limestone Producers Association were: C. E. Thomson, Dietz Hill Development Co., Kansas City, board member; Mrs. James W. Cox, secretary; Robert M. Koch, secretary, National Agricultural Limestone Association, Washington, D. C.; Mrs. L. W. Hayes; Ben P. Connell, Valley Dolomite Corp., St. Louis, retiring board member; Mrs. Paul N. Doll; L. W. Hayes, Kansas City, retiring president of board of directors; and Paul N. Doll, Jefferson City, manager

Safety Programs Reduce Insurance Rates

MISSOURI LIMESTONE producers are paying the lowest rate in years for compensation insurance. The major reason for this favorable condition is the reduction of accidents through safety programs, and the resultant reduced number of claims against insurance companies, the Association News Letter reports.

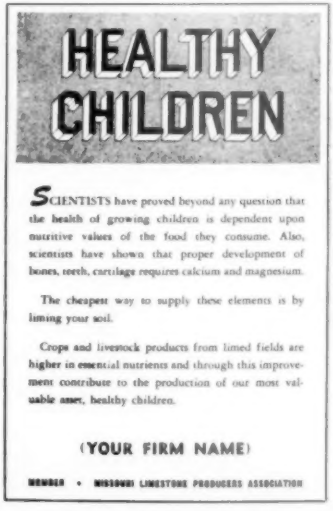
Survey Conservation Needs

NATIONAL AGRICULTURAL LIMESTONE ASSOCIATION, INC., reports that a recent survey of national conservation needs, conducted by the Production and Marketing Administration in connection with the 48 State Agricultural Colleges, shows that the nation should spend $1,277,000,386 through the Agricultural Conservation program, or four times the $300,000,000 annual program of recent date.

Estimated tonnage used through the program in 1947 by several midwestern states is as follows:

State	Total Tons Needed	Tonnage Used by State in 1947
Illinois	8,399,000	4,000,000
Indiana	5,142,000	2,500,000
Iowa	8,249,000	2,900,000
Missouri	5,500,000	2,500,000
Ohio	5,000,000	1,850,000
Wisconsin	4,500,000	2,400,000

Profit
Total return $3.00
Total cost 1.00
$2.00
All of us are interested in realizing a profit from our efforts and investment. There is no way for a farmer to assure himself of a greater profit than by proper use of agricultural limestone as recommended by your county agent.
Our Agricultural Experiment Station has proved that, for EACH DOLLAR expended for agricultural limestone on lime deficient soils a farmer will receive THREE or more in return.
Three dollars back to you for one dollar expended is real PROFIT.
Let us help you add to your profit.
(YOUR FIRM NAME)
MEMBER • MISSOURI LIMESTONE PRODUCERS ASSOCIATION


HEALTHY CHILDREN
SCIENTISTS have proved beyond any question that the health of growing children is dependent upon nutritive values of the food they consume. Also, scientists have shown that proper development of bones, teeth, cartilage requires calcium and magnesium.
The cheapest way to supply these elements is by liming your soil.
Crops and livestock products from limed fields are higher in essential nutrients and through this improvement contribute to the production of our most valuable asset, healthy children.
(YOUR FIRM NAME)
MEMBER • MISSOURI LIMESTONE PRODUCERS ASSOCIATION

Mats for the two advertisements reproduced above are distributed by the Missouri Limestone Producers Association. On the left is the type of material directed to farmers and on the right is the type of publicity directed to the general public

Brute Power for Brutal Jobs!

It's a "dog's life" for engines that are constantly battling the dust, grit and sudden overloads of crusher operations. But "Caterpillar" Diesels don't mind tough going. Seals and filters protect these engines at every vital point. And there's always a liberal reserve of power beyond the conservative ratings.

Lambert Bros., Inc., of Knoxville, Tenn.—along with hundreds of other crusher and quarry operators—can testify to those things. So highly do the Lamberts think of "Caterpillar" Diesels that they already own *seven*. Three are visible in the above picture: A D13000 which drives a Telsmith crusher; a D17000 which runs a Simmons crusher; and a D13000 Electric Set which powers lights, screens and conveyors. Average output is 200 tons of road stone per hour.

Says Fem Lambert: "You know my opinion—it's the same as that of all road men . . . *there isn't anything that compares with 'Caterpillar' equipment.*"

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

Excavating trap rock at a New Hampshire stone quarry. Note dual dump bodies on semi-trailer

100 Weeks of Travel

(Continued from page 102)

highways and highway needs. We have countless times remarked about the almost pathetic highways leading into some of the older eastern and southern cities; the narrow, twisting roads, with many bridges one-way, and practically all bridges narrower than the highway. Small towns seem to think it necessary to route through traffic down their main streets so that the auto driver can more easily kill some of the town's inhabitants. And the pitiful thing about it is that there seems to be nothing done about these type of highways. When we compare approaches to Nashville, Atlanta, Knoxville, Cincinnati, Chicago, Pittsburgh—just to name a few, with approaches to some of the western cities one can only shake his head in wonderment. For instance, in the state of Washington most of the bridges are twice as wide as the highways. Where roads have a high traffic density, new ones are being built almost alongside the older ones. In California where the highest traffic density of any state in the union exists, vast sums are being spent to widen highways to six lanes with wide media strips between. Where the new roads pass through a suburban business section, that section is walled off by a heavy concrete wall that is about 5-ft. high. A person can park in front of one of these business houses, back out and be on his way without worrying about or interfering with the main traffic stream.

Uniform traffic laws, uniform traffic marking, uniform location of traffic lights, throughout the United States would save many lives and speed up traffic. In some states you can do certain things while in others the driver must do exactly the reverse. It is surprising the amount of apparent cunning that some highway officials use in hiding a traffic light, and the last time most of these lights were washed, must have been close to the end of World War II, if one is to judge from the effective light emitted.

During our travel period we visited the three areas in the United States where our atomic energy developments center. We made no effort to find out what was going on behind the walls of secrecy that rightfully surround these operations. These areas are in New Mexico, eastern Tennessee, and eastern Washington. Big things are afoot in all of the centers from a construction standpoint. In the Pasco-Kennewick-Richland district in eastern Washington, the three little cities have many of the characteristics of an old time mining boom; people living in rented tents with the vacant lots full of trailers for construction workers. The drain of cement into these areas is unquestionably large.

Large Phosphate Developments

In Florida, the phosphate developments have been on a grand scale. Several new and gigantic plants went into operation and these plants were said to cost from $3,000,000 to $10,000,000. Several are now under construction there at cost figures that are tremendous. When the phosphate resources of Florida start to wane we can fall back on some of the enormous deposits in Wyoming, Idaho, Montana, and Utah. Companies are now doing pioneer research work to beneficiate these ores as a step in the solution of the transportation problems. Some of the higher grades of phosphate materials are even now said to be reaching mid-west farmers from these distant points.

Portable Plants

The use of portable plants by established producers was noted in many instances. In several the portable units were used as pre-treatment plants for crushing, preliminary sizing, removal of a dry sand, or dry road stone—after which a part of, or all of the material would be sent to the permanent screening and washing plant for final sizing.

We sensed a desire by many large aggregates producers to experiment in a large way with various types of production equipment. One company had several fleets of Carry-alls for stripping and for digging and hauling the aggregates to the plant. This type of heavy equipment is seen very often on highway construction work and its performance will be watched by the industry with interest.

Belt Conveyor Installations

The use of long, wide, and heavily constructed belt conveyors to transport material from the quarry or pit was noted in so many instances that it is becoming quite standard practice. Practically all of these long installations had a surge pile after the primary crusher. One crushed stone operator in a south Atlantic state was preparing to build a surge pile from which minus 10 in. granite stone would be reclaimed. The recovery of stone of this size is obviously no simple problem, and this too, will be watched with interest.

In the concrete products and ready-mixed concrete branches of our industry practically all of the plants in both groups were of relatively large capacity, of all-steel construction, and embodied the latest in automatic weighing and batching equipment. The ratio of new plants using pre-shrunk techniques, to new plants using simple batching was about 2 to 5 as from our observations. The use of non-agitator bodies, in the areas west of the Mississippi is still in the trial stages.

The block plants visited were of ultra-modern design in practically all cases and the newer plants were using the latest equipment that the manufacturers had to offer. Front-feed pallet units were observed in two new plants on the Pacific Coast. Steam curing of block was universally practiced by these larger and newer plants and some of the older companies talked of changing from air curing to steam kilns. None of

BALANCED STRENGTH of Bemis Multiwall Paper Shipping Sacks is the result of control of paper quality plus careful manufacturing methods. Always specify Bemis Multiwall Cement Sacks.

BEMIS

"America's No. 1 Bag Maker"

Peoria, Ill. • East Pepperell, Mass. • Mobile, Ala. • Houston, Texas
San Francisco, Calif. • Vancouver, Wash. • Wilmington, Calif.
Baltimore • Boise • Boston • Brooklyn • Buffalo • Charlotte
Chicago • Cleveland • Denver • Detroit • Jacksonville, Fla.
Indianapolis • Kansas City • Los Angeles • Louisville • Memphis
Minneapolis • New Orleans • New York City • Oklahoma City
Norfolk • Omaha • Phoenix • Pittsburgh • St. Louis • Salina
Salt Lake City • Seattle • Wichita

BEMIS BRO BAG COMPANY

the new plants used high pressure steam (autoclaves). All of the plants visited were very busy. Not all of the plants visited were of large capacity as many new ones capable of producing around 2500 standard 8's per day were well established in smaller towns and cities.

Whether the shortage of portland cement has been much of a factor in the installation of new black top plants—that we are not prepared to judge—but black top plants as a part of the aggregate production fraternity are becoming so common as to have little news value, except for local interest. From observations in the field, there appears to be a slight slowing down of ready-mixed concrete plant and block plant construction because of the inability to obtain adequate and dependable portland cement supplies.

Developments in Special Sand Processing Machinery

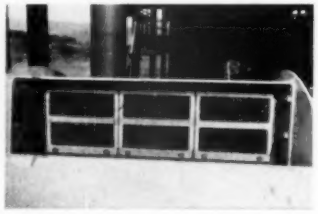
During the two-year period we visited seven plants in our field using the sink-float process and as a result of the publicity we gave this process in ROCK PRODUCTS, the first sand and gravel operation in the world to use this novel technique went into operation near Winnipeg, Ontario, Canada. According to authoritative sources, the builders of a huge air strip there were faced with a $2 freight rate on gravel from more remote sources. Nearby was a gravel deposit that had a considerable amount of shale in it, and by use of the sink-float process, using a semi-portable plant, the gravel has been put into an acceptable condition and at a cost of only a few cents per ton. In Maryland, a sand and gravel company also purchased a sink-float plant that will be used by the company in one of its subsidiary coal operations, but the purchase of the unit by an aggregate producer is in itself significant.

One cement plant engineer and chemist to whom we talked was much interested in the sink-float process as a means of removing reactive aggregates from gravel, so that the gravel could be more safely used with high alkali cements.

Quite universal in the Southwest is the practice of placing reinforcing rods in concrete masonry construction. Here an operator is sawing grooves for such rods

There is a growing and intense interest in the subject of reactive aggregates, and in the new specifications that the Army Corps recently published. These were quite drastic, and among other things, stated that dolomitic and limestone aggregates could not be used with siliceous sands. (See December, 1948, ROCK PRODUCTS.)

These new specifications from a sizing standpoint are very difficult to meet without grinding equipment and three of the large dam projects now just getting started under Army Engineer Corps supervision are installing large capacity, peripheral discharge, rod mills so that the requirements can be more easily met. Spiral type classifiers for sand recovery have been installed in many plants and are meeting with good success.



Compartments making up this sand dewatering wheel have porous sides and bottoms, made up of fiber brushes

The manufacture of sand by grinding and blending it with un-ground sand brings up the question of blending the two materials. In one new plant visited a large rod mill was being installed to grind pea gravel to sand sizes. This product will go to its own surge pile—incidentally there were a total of seven intermediate surge piles in this new plant—along with the pit sand. After reclaiming by belt conveyors, the sand will go to a screening section and a sand wheel where four sizes of sand will be made and these all stored in large concrete bins. Two of these bins will feed a blending and loading belt by gravity and the other two bins have heavy screw conveyors constructed in the bottom of the bin and these screws will deliver the finer sands to the blending and loading belt. By the use of screws, arching of the damp sand is expected to be over-come. However, in another plant using fine grinding (a ball mill—in this case) the blend between natural sand, sand produced from two cone crushers in series, and the sand from the ball mill was being blended in a continuous manner, and as it was being manufactured. This appears to be the simpler solution of this blending problem, but it requires great watchfulness, and if the trend continues, we can expect to see metallurgists take over the operation of many sand plants. By metallurgists we refer to the type of technical men that supervise highly complex milling and beneficiation processes in the metal mining industries, such as copper, lead, zinc, gold and silver. This type of skilled operator has long been used to splitting hairs when it comes to classification problems and to solving them efficiently, cheaply, and continuously.

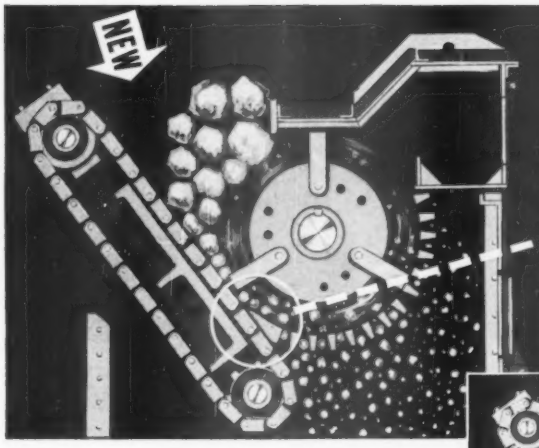
Truck, upper left, is dumping crude phosphate rock to a semi-portable plant where material is given preliminary crushing before being loaded to gondolas

We observed a considerable interest in petrography so that the chemical and mineralogical content of aggregates could be determined. One large and aggressive manufacturer of fluorescent lighting equipment (so-called black light, or tungsten lights) stated that he had just recently sold several large-sized black lights to sand and gravel companies but he had no specific idea as to their use. We might here point out, that many opaline rocks fluoresce under this light so it makes their identity easy to determine. However, a more interesting part of this discussion is that when the rock does fluoresce it usually contains small amounts of radioactive materials, so a Gieger counter and a fluoroscope, an X-ray for the petrographer, and a few metallurgists may round out the future equipment and personnel of the really modern sand and gravel plant.

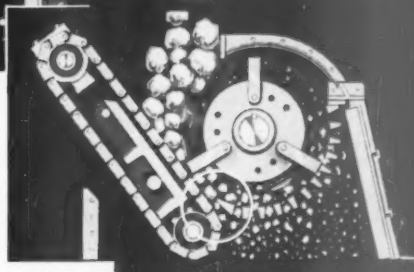
New Cement Plants

A few new cement plants in our line of travel were being built in 1948 and are confined mostly to the West. A new one visited recently went into operation in South Carolina. Work is going ahead on one near Tucson, Arizona, and one at Corpus Christi, Texas. One new plant proposed for New Mexico is apparently being held in abeyance. A new one projected for California near the swanky Palm Springs winter resort has run into some difficulty as the resort owners object. Authoritative sources seem to think that the plant will be built anyway. Colorado and Utah both had practically new plants going into operation. A new plant is rumored for western Wyoming. In the desert area of California an old plant was rebuilt into practically a new operation. It featured uncommonly long dry-kilns—350-ft. In Tennessee an old plant is being rebuilt from crushing plant to finish silos and when this work is completed, sometime late in 1949, it, too will be practically a new plant. Oregon re-

(Continued on page 114)



BETTER CRUSHING BEGINS HERE!



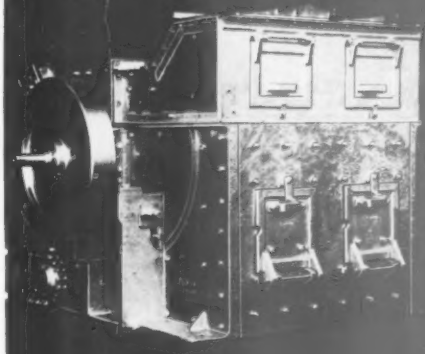
Crushing money is saved or squandered in the "heart" of the mill . . . where reduction begins! That's why the headline feature of the new, improved "36 Series" Dixie Hammermill is the extension of Dixie's Continuously Moving Breaker Plate*. . . a unique, money-saving innovation that sets a new standard of crushing efficiency.

Note by comparing before and after diagrams how the new, Extended Moving Breaker Plate guards against the passage of oversize material between the breaker plate and front cage bar. The result—improved grinding control for unvarying uniformity of product that makes the Dixie Hammermill now, more than ever before, your guarantee of greater production at less cost.

Dixie "36 Series" Hammermills, for primary or secondary crushing, are built in 4 sizes in capacities ranging from 25 to 150 tons.

*U.S. Patents Granted and Pending.

WRITE TODAY FOR COMPLETE DETAILS!



NEW! IMPROVED! DIXIE HAMMERMILL

Other important changes in the new "36 Series" Dixie Hammermill include:

- 1. All-steel construction for greater strength . . . longer life
- 2. Flange type end discs of all cast steel for protection of hammer bolts and nuts from wear at ends
- 3. Convenient clean-out and inspection door
- 4. Metal trap (optional) for facilitating removal of tramp iron.

DIXIE

100 Weeks of Travel

(Continued from page 112)

built a plant making it practically new. Many other plants in the east have undergone drastic re-vamping.

One company in South America is installing what is said to be the first Leopol kiln to use the wet process, according to a Western engineering company official with whom we talked. Another new engineering company in the West sourced the information that it was working on six or more small cement plants to go into South America and orders had already been placed for one of these plants. This engineering company had associated with it several well known cement technicians, and their proposal was to design a "standard" plant that would have a capacity of 1000 bbl. per unit. If the operation called for higher production, they proposed to add more of the standard units. They will manufacture no equipment of their own but will select individual pieces of machinery from sources they deem best to fill the particular need.

In the West two new wallboard and gypsum calcining plants went on the production line, both in central Utah. One for Arizona is projected. In central Texas a new and modern lime plant was built. In our travels we ran into several instances where large users of lime had installed their own lime burning plant using relatively small capacity, continuous kilns that follow somewhat the designs of the Scott furnaces used in the quicksilver and magnesite industry. Two of these types of furnaces were installed in a south Chicago plant last year. A new lime plant in Oregon is slowly emerging from the promotional stages and when it is in production it should do much to relieve the critical shortage of lime in the Northwest. One large gypsum company in the West installed rubber tired tranporters or haulage units in their underground mining operations. This huge unit is loaded mechanically after which it proceeds to the unloading point near the portal of the mine where it unloads. The transporter is so long that its bottom is made in the form of a pan conveyor so that when the back end is loaded the material is "inched" forward by the operator and the empty space now in back is filled. No tracks are needed for this haulage unit and it marks a development of interest to all underground miners.

We observed several operators trying out the tungsten insert bits with considerable success and it seems that the best results are obtained by using bits 2 in. or less in diameter with drills of lighter weight. Breakage of the steel near the shank has been corrected by the use of the lighter drills and by the use of alloy steel rods. The drilling rates are extremely fast and holes in the 8- to 10-ft. range can be drilled without loss of gauge. Powder of the same diameter as the hole can then be used and loading in this manner is said to be much more effective than old practices.

One mine operator with whom we talked said that the cost of the bits was high and that rumors went around his operation that they were far more valuable than they were. Hence some 20 percent of all bits going into the mine were stolen by "high-graders" who possibly hoped to peddle them to neighboring mines.

Haulage units in the quarries are getting larger and we saw several such units handling 30 to 38 tons per load, with all transportation being on company owned roads. We saw several gravel operators hauling 18 ton loads on bottom dump units that were powered by a semi-trailer. The power plant could, and sometimes did pull a second such haulage unit but customer considerations often made it impractical to use but one bottom dump. We heard rumors of one mid-west operator who was going to cut the Gordion knot, so to speak, and to design and use a truck that would handle 60 tons of rock.

The use of spiral concentrators in the new phosphate plants of Florida have demonstrated their value as a separating device, and where coal has to be removed from sand, these devices could be studied. Incidentally a plant is being built in Florida to treat illmanite, rutile, and zircon sands and these spiral concentrators will be mounted on floating pontoons.

In the mid-west a new slag plant went into operation that features a large usage of magnetic separators throughout the plant. These groups of separators handle material from coarse to dust and the operators have been able to clean up their product so that it is finding use in many chemical and related industries.

On the side of the new additives for concrete, at a project on the lower Colorado river, a special shale (Puenta shale) that contained around 20 percent microscopic opals was being used in the green concrete to correct the alkali content of the cement. The shales had previously been calcined to temperatures in the 1600 deg. F. range and were ground to the approximate fineness of portland cement. They were using 20 lb. of the additive to 80 lb. of portland cement.

Throughout the land we ran into so many new sand and gravel plants and crushed rock plants that space does not permit of even an outline of their designs. We have here only attempted to hit the high spots of 100 weeks of continuous travel during a time when things were really moving forward in the rock products industries.

Blasting-Photography

(Continued from page 85)

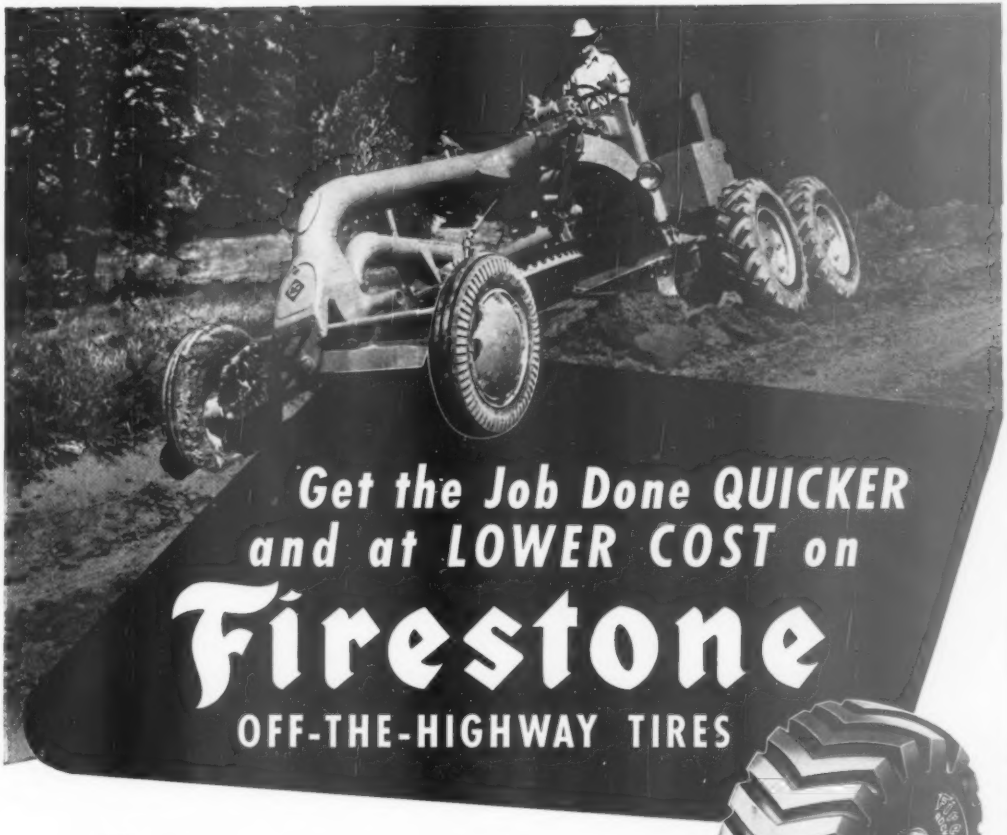
Our pictures of the blasts firing showed that the stone was coming out in huge blocks and not breaking. We then tried loading the well drill holes in a different manner. We even tried using a combination, by loading the well drill holes half way up the face and above this point, we drilled 2¼-in. vertical holes, spaced 5 x 5 ft., and loaded them with 40 percent dynamite, hoping we might break the top layer with the smaller holes. As this shot fired, our pictures showed it had not worked out as planned and instead we not only had a lot of big blocks, but in addition a lot of over-hang and backbreak. We then decided to use a full column load of a smaller size of explosive and the pictures showed this to be breaking the lower section all right, but the top layer was still coming down in blocks. Our next step was to drill jackhammer holes down in the top layer to a depth of 7 ft. and spaced 4 x 4 ft. with the back row, which was in line with the well drill holes, slanted out 8 in. at the bottom. The well drill holes were loaded solidly with 4-in. explosives to within 11 ft. of the top and the smaller 1¼-in. holes were each loaded with six sticks of 1- x 8-in. 40 percent dynamite. We used a delay interval of .0123 seconds and fired the smaller holes along with the well drill holes. At last we had found the answer and even though the smaller holes are within 4 ft. of the larger ones and the same distance to the adjacent jackhammer holes, we never had a single cut-off of the Primacord or a mis-fired hole. Throughout this entire procedure we took pictures of every shot and we give a lot of credit to photography for licking a very nasty, blasting problem.

Almost every operator and blaster has his own method of calculating the distribution of explosives and firmly believes it could not be improved in any way. If he leaves the loading to his powder company he usually likes to know how the explosives are distributed in the holes. Certainly no one should question his judgment in this most important phase of blasting, but does he know that his method is the best? If he is getting good fragmentation with a minimum amount of powder, along with little throw, there is a possibility that no improvement can be made and it is doubtful if any change should be made but this condition is seldom found. By means of photography it can be positively proved whether or not the powder is properly distributed. One of the best means of determining this is to use two cameras, one for a side view and one in front, as near the middle of the shot as possible. It is not necessary to be close to the face for a picture of this kind because even though the picture is taken from a distance, if the camera is kept absolutely still, good details will be found when the picture is enlarged.

Suggested Use

When pictures are taken showing an end view, the camera should be

(Continued on page 117)



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Blasting-Photography

(Continued from page 114)

far enough in front of the face to give a full view of the entire line of holes as they fire. This picture will positively prove what part of the face is moving first. If it is found that the bottom is coming out too fast, there is a possibility that some of the powder loaded there should be located higher up in a deck charge. If the middle of the shot is bulging out in a bow, this is a good indication that the bottom is loaded too light. Much can be learned from the side view but equally important is the picture taken in front. In this one can be seen what is taking place over the entire face as the stone is breaking. In many cases it will be found that the big stones sometimes believed to come from the top are actually stones not broken due to improperly placed deck charges. In any event, a few good sets of pictures taken in this manner will show whether or not the results are all that might be expected from the explosives used.

Today, almost every one is interested to a certain degree in pictures and to those reading this who might be in that class, it would be well worth the time required to get at some good location the next time a primary blast is to be fired and have the camera set on a solid base and loaded with a fast film. When the blast fires get a picture. Have it developed and enlarged to a size big enough to see details of the stone as it is breaking. Then, instead of laying it aside, study it and see exactly what happened and what did not happen. After a few pictures of this kind it can easily be seen that photography has a definite practical value with blasting.

Gypsum Co. to Cut Costs

NATIONAL GYPSUM CO., Buffalo, N. Y., has undertaken a program to cut $1,500,000 from certain of its operating costs in 1949, and another $1,000,000 in 1950 according to Melvin H. Baker, president. The program entails standardization of practices and stepped-up efficiency, specifically: readjustment of ship-unloading facilities and techniques on the East coast; standardization of high-speed production methods; standardization of new manufacturing methods already proven but not yet developed to peak efficiency; and better employe-training to increase worker productivity.

Rock Wool

(Continued from page 104)

noticeable amount of wool dust or "fly" wool in the air. In severe cases, this has caused considerable throat and nasal irritation.

Dr. R. R. Sayers, chief, Division of Industrial Hygiene, United States Public Health Service, states:

"From some experiments we have performed, using mineral wool fibers, we have found that particles remain in the tissue, producing an inert foreign body reaction similar to that of asbestos, and we have been considering dust from mineral wool as potentially harmful, that is, capable of producing a diffuse pulmonary fibrosis, when inhaled." . . . We have been considering dust that produces an inert reaction less harmful than pure silica and more dangerous than dusts which are absorbed from the tissues, such as limestone."

This indicates there is some danger from inhaled mineral wool dust, but its action is mechanical rather than pathological.

85th Anniversary

(Continued from page 79)

Hydration is done in a six-drum Kritzer continuous machine, with the raw hydrate passed through a No. O Raymond beater mill equipped with a deflector-type separator and air-float system. The finished hydrate product is sacked through a 3-tube valve packer for direct loading for shipment or for storage in paper bags.

Labor requirements for the plant are small and are divided about as follows: Quarry—drilling and blasting, 2; loading, 1; truck drivers, 3; primary crushing, 1; and secondary crushing, 1. Kilns—firemen, who do charging and drawing also, 3; lime shed sorters and loaders, 3; hydrator operator, 1; sackers and loaders, 2; and general repairmen, 2, a total of 19 men.

Quarry operations are on a 6-day week, while lime operations are a continuous affair seven days per week.

The present officers of the company are Ralph B. Menke of New York City, president, and grandson of the founder; Albert L. Bitter, vice president; and E. H. Siebrasse, secretary and treasurer. George Holzgrafe, a veteran of many years experience in lime and limestone production, is plant superintendent.

R. B. Menke

E. H. Siebrasse

A. L. Bitter

Geo. Holzgrafe

Crushed Stone Ass'n. Short Course

NATIONAL CRUSHED STONE ASSOCIATION, Washington, D. C., has announced that its third Short Course will be held in Washington February 2-6 just prior to the N.C.S.A. Annual Convention.

The program will get underway on the morning of February 2 with an introduction to the course by A. T. GOLDBECK, engineering director, N.C.S.A., and director of the course. "Origin, Geology and Classification of Rocks" will be covered by DR. HERBERT INSLEY, chief, Mineral Products Division, National Bureau of Standards, and J. E. GRAY, field engineer, N.C.S.A., will discuss "Gradation of Aggregates, Sieves, Maximum Density."

In the afternoon, A. T. GOLDBECK will speak on "Specific Gravity, Absorption, Solid Volume and Voids," and "How Aggregates Affect the Behavior of Concrete Pavements," and J. E. GRAY will discuss "The Proportioning of Concrete." D. O. WOOLF, senior materials engineer, Public Roads Administration, will cover "Alkali Reactivity."

Thursday morning's session will cover the following topics: "Bituminous Binders-Classification, Characteristics and Best Use for the Different Grades" by GEORGE H. DENT, district engineer, Asphalt Institute, who will discuss asphalts, and GEORGE E. MARTIN, consulting engineer, The Barrett Division, Allied Chemical and Dye Corp., who will discuss Tars; and "The Composition and Characteristics of Bituminous Mixtures and the Conditions for which They Are Best Suited" by CARL A. CARPENTER, senior materials engineer, Public Roads Administration. Afternoon discussion will cover: "Bituminous Surface Treatments" by PAUL CRITZ, senior civil enginer, Public Roads Administration, and "The Problem of Flexible Pavement Design" by A. T. GOLDBECK.

Friday morning will be devoted to the following topics: "Macadam Roads" by Fred Swineford, engineering director, Macadam Pavements, Inc.; "Soil Aggregate Stabilized Roads," by E. V. Scott, assistant general manager, Southwest Stone Co.; and "Railroad Ballast" by A. T. Goldbeck. The afternoon session will cover: "Stone for Use in Trickling Filters," by James W. Field, sanitary engineer, Engineering Division, Office of Chief Engineers; "Stone for Use in Concrete Block" by John Biggs, engineer, N.C.S.A.; and "The Question of Flat and Elongated Pieces," by J. E. Gray.

Laboratory demonstrations will be conducted in the N.C.S.A. laboratory on Saturday morning as follows: aggregate tests—Deval abrasion, Dorry hardness, Page impact, Los Angeles abrasion, sodium sulphate with before and after examples, specific gravity, and volumetric change; concrete—slump and flow tests, compression tests, beam tests, and freezing and thawing including expansion measurements, dynamic modulus; bituminous concrete—immersion-compression tests for durability, circular track test for durability, and stripping tests for adhesion of asphalt.

Slag Association Meeting

NATIONAL SLAG ASSOCIATION, Washington, D. C., held its 31st Annual Meeting at Wardman Park Hotel, Washington, D. C., on November 18-19. A meeting of the budget and finance committee, H. N. Snyder, chairman, was held on the evening of November 17.

W. E. BLISS, president, called the meeting to order on the morning of November 18, at which time FRED HUBBARD, director of research, and E. W. BAUMAN, managing director and secretary, presented their annual reports, and G. W. JOSEPHSON reported on the present status of the "Slag Book." Committee reports were given by the following: L. E. MCDERMUT, chairman, membership committee; C. E. IRELAND, chairman, advertising and publicity committee; and FRED HUBBARD, chairman, problems committee. Following appointment of the nominating and special committees luncheon was held with H. H. HALE, executive secretary, American Association of State Highway Officials, as guest speaker.

At the afternoon session, the following topics were discussed: "Present Day Blast Furnace Practices in the Production of Iron and Slag," by A. H. FOSDICK, superintendent, Bethlehem Blast Furnace Department; "Promoting Safety in the Slag Industry Through Plant Competition" by FOREST T. MOYER, chief, Accident Analysis Branch, U. S. Bureau of Mines; and "Open Top Car Supply Outlook for 1949," by W. E. CALLAHAN, manager, Car Service Division, Association of American Railroads.

The evening program included a reception for guests and the annual banquet, with REUEL W. ELTON, general manager, American Trade Association Executives, as speaker. Over 50 were present including guests from various agencies of the Government.

A single session on November 19 included reports of the treasurer, the budget and finance committee, and the nominating committee. The following officers and three executive committeemen at large were elected: E. L. Flad, manager, Slag Division, Carnegie-Illinois Steel Co., president; G. A. Mattison, Jr., Woodstock Slag Corp., Birmingham, Ala., vice-president; E. W. Bauman, Washington, D. C., managing director and secretary; W. S. Shaw, Washington, D. C., treasurer; and C. E. Ireland, Birmingham Slag Co., W. E. Bliss, Standard Slag Co., and L. E. McDermut, Illinois Slag and Ballast Co., executive committeemen-at-large.

Agricultural Limestone Convention

NATIONAL AGRICULTURAL LIMESTONE ASSOCIATION, INC., will hold its fourth annual meeting and convention January 18-20 at the Hotel Statler, Washington, D. C. Since this is also inaugural week in the Capitol, a record crowd is anticipated. President H. C. GRAY, secretary-treasurer of Standard Paving Co., will call the opening session to order on the morning of January 18, at which time there will be a treasurer's report, report of committees, secretary's report, and announcement of new committees.

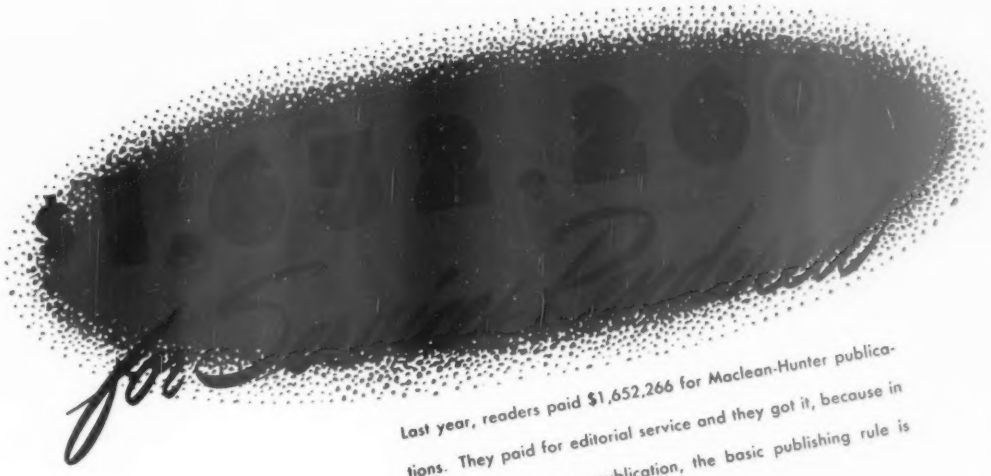
CHARLES F. BRANNAN, Secretary of Agriculture, will give an address at the greeting luncheon after which director VINCENT H. SHEA, president of Allied Minerals, Inc., will call the afternoon session to order. RALPH S. TRIGG, administrator of the P. & M.A., U.S.D.A., will discuss "The Production and Marketing Administration and the Agricultural Conservation Program"; A. V. MCCORMACK, director of the A.C.P. branch, will speak on "The 1949 and 1950 National Agricultural Conservation Programs"; and ROLAND CRUMPLER, chief of the conservation materials and services section, will cover "Trends in Purchasing Liming Material Under the A.C.P."

Reception for members and guests will be held in the evening followed by the annual banquet. WILLIAM A. ALBRECHT, chairman of the department of soils, University of Missouri, will speak on "Declining Soil Fertility, Its National and International Implications," and MAURICE J. TOBIN, Secretary of Labor, will cover "Labor Relations — Industry, Management, and the Public."

Director B. T. SCHARBACH, vice-president of Sand & Stone, Inc., will preside at the morning session, January 19. Topics to be presented include: "Moistening Bulk Lime for Spreading" by M. L. DAKE; "Status of Supply of Freight Cars" by W. E. CALLAHAN, Association of American Railroads; and "Freight Rate Increases" by ROBERT N. NASH, Association of American Railroads."

Director C. P. HAUN, president, Franklin Limestone Co., will preside at the luncheon at which time there will be an address on "Delivered Pricing and the Cement Decision" by H. P. FOWLER, general counsel of the Chamber of Commerce of the United States.

The afternoon session will be devoted to a report of the nominating committee, election of directors, reports of committees and unfinished business. A meeting of the board of directors also will be held. No sessions are scheduled for January 20 because of inaugural ceremonies at the Capitol. A television set will be provided for those who do not wish to attend the parade, and in case of inclement weather.



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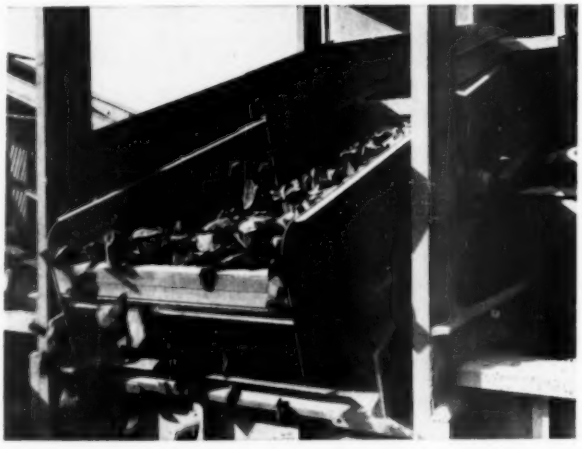

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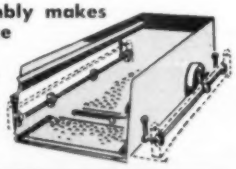

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Sand Separation

(Continued from page 95)

or weir. The perimeter of the 20-ft. hydroseparator is 63 ft.

Using the same reasoning as before, we have

$$Q = V \times A = \sqrt{2gH} \times L \times H$$
$$2.25 = V \times 63 \times 0.04$$
$$V = 0.9 \text{ ft. per sec.}$$

We need not carry the computations beyond this point for we know from the analysis of the previous installation that a current velocity of about 1 ft. per sec. will provide enough time to drop out No. 100-mesh particles and some No. 200 mesh in an effective flow of say 9 ft.

Sand Sizing

The underflow of the hydroseparator goes to two hindered-settling type classifiers, or called in this installation "sand sizers." They are large size editions, with improvements, of the Fahrenwald classifier developed for the mining and metallurgical industry many years ago. They are known as hindered-settling classifiers because they are designed to classify by specific gravity or size in a column of water which has an inlet at the bottom and a rising current through the material. This keeps the materials in suspension or in "teeter," and makes the device in effect a "heavy media" classifier. The amount of water admitted at the bottom of the column obviously will control the rising velocity of the liquid in the column, and hence can be adjusted to the falling velocity or rate of any particular size of material it is desired to settle out. The total surface area of the two sizers is apparently about 68 sq. ft.

The two sand sizers in this installation have eight classifying columns each. The feed (the hydroseparator underflow with 50 percent water) is fed to these sand sizers, presumably at a rate of about 40 t.p.h. each. The rising current of "hydraulic" water supplied through valves to the bottoms of the classifying columns is at the rate of 200 t.p.h. from a fresh supply through a constant head tank. To make a classifier of this type operate satisfactorily, both the feed and the hydraulic water supplied must be constant and uniform. This fresh water with the water already in the sand makes about a 6:1 dilution, as sand plant operators figure it, or about 3:1 dilution on a weight basis as mining engineers use the term.

The outputs of the sand sizers are combined as shown in the accompanying sketch, but of course the scheme has much elasticity and it is possible to combine any combination of sizer products, or to omit the output of any one or more settling columns, if necessary to correct a concrete fine aggre-

Sand Separation

gate. There is also much leeway in the control of the sizes retained in the various settling columns by simple operation of the pinch valves which admit the hydraulic water. In this operation, it is reported that these valve settings need little attention after once being adjusted to the current material, which is dredged from the Willamette River and delivered in barge loads. The operation is notable and strictly up to date also in the practice of making constant control sieve tests.

The final processing of the sand output of the hydroseparator and the two sand sizers, just described, is to dewater the products in two sand drags and a screw (for the finest sand). The three sizes of sand (including the rashly named "muck sand") are stored in separate bins and subsequently blended to meet specifications, or shipped in separated sizes, as shown in the accompanying sketch (from our October issue). The only part of this operation which apparently may cause trouble is the dependence on the loading-out belt for blending the various sizes of sand. To get a really satisfactory blend some operators have come to the conclusion that it can be done only by thorough mixing in plenty of water.

Conclusions

The trend is definitely to prepare concrete sand in at least two sizes of gradations. There are various ways to do this, as illustrated both in the plants described here, and in some previously described in this journal. It is advantageous to the ready-mixed concrete producer to have a fairly well-graded fine aggregate. It is, and should be, in many instances a premium product because of the saving in cement and the better concrete. The sand producer's problem is to decide whether to go to the expense of recovering the rare fines, or to purchase a fine material to be used as an admixture or to blend with his sand.

Labor Relation Trends

(Continued from page 57)

ciently in scope, it could substantially reduce the flow in interstate commerce of raw materials for use by that company in the conduct of its business, and likewise it could substantially reduce the flow in interstate commerce of manufactured products to its customers in other states. And the general practice of establishing and maintaining secondary boycotts of that kind multiplied or extended throughout the country would necessarily effect a reduction in the flow in interstate commerce of both raw materials and manufactured commodities.

"Therefore, while the activities of

An Eagle Log Washer at the Thomas Gravel Co.

"We installed an Eagle Log Washer to remove clay balls and soft particles from our gravel and we do not hesitate to state that the washer is DOING JUST THAT." There's the satisfied statement of the Thomas Gravel Company after installing an Eagle at their Fort Worth plant. The Thomas pit is a river-bottom deposit of about 90 acres of excellent quality basic aggregate which did, however, need to be cleansed of undesirable material. Eagle sets a new high standard for trouble-free solution of just such knotty problems.

This 7x20 ft. paddle type log washer features the new paddle shoes with corrugated wearing surfaces which scrub and abrade stone against stone as the aggregate is conveyed up to the discharge. The constantly rising column of water from the tub bottom floats out all loosened trash, clay balls, etc. This two-way cleansing action is just one of the reasons why Thomas is able to conclude, "We are highly pleased with the operation of this Log Washer." Send for Catalog 47.

Sand and Gravel Equipment

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LOG WASHERS — DEHYDRATORS — SAND TANKS
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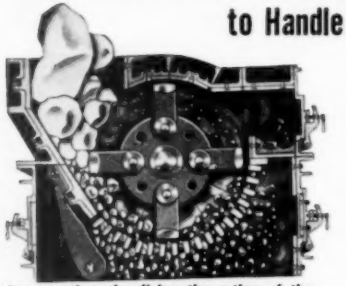

Cross section visualizing the action of the Hammermill in operation.

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Americans feature flexible operation, high tonnage production, and uniform reduction of the product with controlled size. Heavy duty sectional construction gives quick access to interiors for adjustments, and each series is compactly designed for minimum headroom. Capacities up to 250 tons per hour.

A B C

Three types of hammers: (A) "Brute," for heavy reduction, (B) "Broadhead," for medium reduction, and (C) "Splitter," for fine reduction.

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Save Power and Labor On Your Long Haul Digging

This Sauerman Slackline Cableway digs gravel from lake and keeps screening plant supplied with 75 tons an hour at low cost.

Sauerman Scraper moves material from wide pit to crusher.

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CABLEWAYS and SCRAPERS

You can dig and haul from pit, bank, river or pond, strip overburden, or store and reclaim loose materials at lowest cost with a SAUERMAN Machine. Use a Scraper for handling dry material—a Cableway for under-water digging. Either machine will range rapidly over a wide area, digging, hauling and dumping in one operation. Requires only one man at the controls and power consumption is remarkably small, whether electric, gasoline or Diesel. Installation cost is low and maintenance simple.

Let us recommend the right type of machine for your work. Send for our illustrated Catalog and tell us about your own problems.

SAUERMAN BROS. Inc.

530 So. Clinton St. Chicago 7, Ill.

Klassen were essentially local, they were of such character and bore such relation to interstate commerce that a secondary boycott directed against them and carried forward by blacklisting and picketing for the sole purpose of compelling Klassen to cease doing business with Wadsworth constituted an unfair labor practice, within the scope and purpose of the Taft-Hartley Act."

Implied Criticism of N.L.R.B.

The Court of Appeals, in sustaining the District Court and remanding the case to the lower court for further action, made this explanation of the long-time "temporary" injunction (dating from January, 1948): "It is manifest that in making its injunction effective until the Board entered its final adjudication, the court acted in the belief that the Board would make its final adjudication with reasonable dispatch. * * * * But approximately ten months have passed, and the Board has not acted."

Probably some of us who have followed the proceedings of the N.L.R.B. may be tempted to suspect this is politically too hot a potato for it to play with.

C. A. Bernard, American Limestone Co., central division, St. Louis, Mo., assisting some visitors in filling out entry blanks for free agricultural limestone drawing held in connection with the display at the recent National Farm Show, Chicago, Ill.

Agricultural Limestone Institute Staffs Booth at National Farm Show

A LARGER, more impressive display was held this year by the Agricultural Limestone Institute, division of the National Crushed Stone Association, than was held last year in conjunction with the National Farm and Garden Show, given annually in Chicago, Ill. In addition to large photographs and posters plus free literature graphically presenting the benefits accruing to farmers through the use of agricultural limestone on their land, eye-catcher at the booth was a large, working scale model of a typical stone crushing plant. Visitors to the booth were able to see

every detail of the operation of a plant producing agricultural limestone. Model was produced by and contained replicas of Smith Engineering Co. equipment.

A second feature of the exhibit this year was a drawing open to all visitors of the booth and which gave the winner a carload of agricultural limestone. The drawing attracted over 4000 farmers and was won by L. R. Markheim, Elgin, Ill. Agricultural limestone is to be furnished by the Fox River Stone Quarry, located near Elgin.

Henry A. Huschke, managing director of the Agricultural Limestone Institute, Washington, D. C., was in charge of the exhibit. As last year, expenses of this year's booth were met by voluntary contributions from member companies. Following are names of individuals manning the booth, also on a voluntary basis: C. A. Bernard, American Limestone Co., Knoxville, Tenn.; G. B. Clark, Mid-West Limestone Co., Gilmore City, Iowa; J. L. Fay, Material Service Corp., Chicago, Ill.; E. L. Heckathorn, Stuntz-Yeoman Co., Delphi, Ind.; W. E. Hewitt, East St. Louis Stone Co., East St. Louis, Ill.; W. E. Kern, Consumers Co., Chicago, Ill.; K. K. Kinzie, Concrete Materials Co., Cedar Rapids, Iowa; Floyd Mumma, Columbia Quarry, St. Louis, Mo.; D. S. Pickett, Lehigh Stone Co., Kankakee, Ill.; Norbert Schwartz, Pontiac Stone Co., Pontiac, Ill.; J. L. Skelly, Linwood Stone Products Co., Inc., Buffalo, Iowa; and Weir H. Traver, Monon Crushed Stone Co., Monon, Ind.

New slogan adopted this year by the Agricultural Limestone Institute, and featured across the top of the booth backdrop, was "Put It On, Don't Put It Off." On a table to the rear of the exhibit were representative soil testing kits.

Lime Association

(Continued from page 87)

not drastically reduced. On certain soils lime has performed more than just PI reduction; it has produced a puzzolanic action by reacting chemically with the available silica and alumina in the soil, behaving in effect like a natural cement. Road cores removed from lime-stabilized roads have exhibited compressive strengths of as high as 1200 p.s.i. The savings afforded by a base of this kind are self-evident, since the wearing surface (pavement) can be made much thinner in view of the high compressive and lineal strengths of the base.

In addition to highways, lime has possible usage as a stabilizing agent in the construction of airport runways and city streets. As long as this market continues to appear so promising, the Association will continue its research and development work in that direction and will widely publicize the progress being made.

(Continued on page 124)

Wear-resisting Dipper Teeth for Only $6.92 each

That's how P&H Hartop hard-surfacing electrodes and P&H Harnimang A help you keep your digging costs down

Fix your worn dipper teeth this easy, low-cost way: Take a piece of manganese bar stock (they roll it in just the right shape) and weld it to the tooth stub with P&H Harnimang A. We suggest Harnimang A, because this nickel manganese electrode gives you high tensile strength and the same kind of resistance to impact and abrasion found in standard manganese steels. It work-hardens to 459 Brinell.

This operation alone gives you a dipper tooth as good as new. For a *better-than-new* tooth, all you have to do is hard-surface the tooth with Hartop Red. The hard protective coating you get from Hartop Red — it has a Rockwell C hardness of 55 — resists impact and abrasion. By the time this coating has worn away, the manganese point has work-hardened and your tooth gives you many extra cubic yards of digging before it needs rebuilding.

This is only one way P&H Hartop hard-surfacing electrodes save money for you. There are 4 types so that you can maintain and repair most anything. Use:

HARTOP BROWN — Rockwell C40 — for angular shock and abrasion.

HARTOP GREEN — Rockwell C50 — for general all-purpose hard-surfacing.

HARTOP RED — Rockwell C55 — to resist severe impact and extreme abrasion.

HARTOP YELLOW — Rockwell C63 — to resist flat impact and abrasion.

Get a few packages of these money-saving electrodes from your P&H distributor. If he can't supply you, write us for prompt service.

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HARNISCHFEGER CORPORATION

8 GILSON FEATURES

1. Makes test quickly and accurately
2. Two to seven separations simultaneously
3. Screen trays independently removable
4. Trays balanced to same tare weight
5. Visible separation to refusal
6. Few moving parts
7. Sturdy construction
8. Size range 4" to 200-mesh

GILSON Mechanical Testing Screen

• This machine is designed for the efficient sizing of test samples of crushed stone, gravel, slag and similar materials. It accommodates samples up to one cubic foot, making from two to seven separations simultaneously, in five minutes or less.

Smaller amounts of very fine materials may be handled efficiently and the screen used for research or other special mass separation jobs down to 100-mesh or finer.

Where exacting specifications are required the Gilson Screen eliminates guesswork—avoids errors and reduces operating delays. A controlled and truly guaranteed product is now possible with the Gilson Testing Screen. For fast accurate sizing of coarse or fines from 4" to 200-mesh specify a Gilson Testing Screen.

GILSON SCREEN CO. BOX 186 MERCER, PENNA.

MANGANESE STEEL CASTINGS

for
PULVERIZERS
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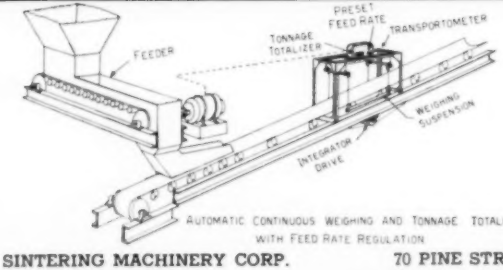

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Joint Industry Research

In this fast-moving chemical age, an industry that does little or no research becomes static and eventually will wither and die since the loss of some markets to other competitive products or new "test tube" products is almost certain. Much of the research being conducted by the National Lime Association is of such a nature that most lime producers would not undertake it as individual companies even though they recognize its importance, the reason being that fundamental research appears too expensive since such research is often long in attaining results and benefits all lime competitors and consumers on practically an equal basis. When such research is carried out by a group, as in the case of N.L.A. fellowships, each participating company receives the benefit—but at a very small fraction of the total cost. Based on comments received from foreign lime companies, it appears that the National Lime Association is conducting the only broad, organized fundamental research program on lime in the whole world today. An increasing number of foreign lime companies are requesting research reports and bulletins of the N.L.A.

Research Benefits

One of the unique features of the lime industry is the widely divergent interests of lime companies with respect to markets. There are a few companies that sell only agricultural lime. Hence their primary interest lies in the agricultural field. Others are interested solely or mainly in building lime, finishing lime, or chemical lime. And still other companies sell actively to all markets. Regardless of a company's individual interest, any development of a new market for lime from industry (Association) research benefits every lime company. For example, if a new chemical or industrial market for lime is developed or expanded, naturally those companies selling in this field are benefited directly through increased markets. At the same time, lime companies primarily interested in building or agricultural lime also benefit, even though indirectly, since increased markets in the other field naturally ease the competition in their own field.

By the same token, a favorable market development for dolomitic lime producers is at the same time probably equally beneficial to the high calcium lime producers since the markets where both of these types of lime producers compete are thereby relieved, and vice versa. The important thing for the lime industry is to have the over-all demand for lime increased steadily. A healthy industry is a growing industry, and research and more research is the only reasonable tonic that applies.

Thus, if the present research and

(Continued on page 126)

Throw Away the Sledge
In '49 —— Install

"BRANFORD" VIBRATORS

AND INSURE FREE FLOW OF MATERIALS THRU THOSE BINS, HOPPERS, CHUTES AND SCREENS WHERE CLOGGING OR HANGING UP OF MATERIALS OCCUR.

ELIMINATES COSTLY POKING AND SLEDGING TIME AND STEPS UP PRODUCTION, THUS MATERIALLY AIDING YOU TOWARD A —

PROSPEROUS NEW YEAR

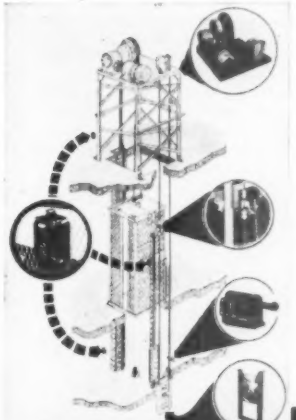
VIBRATORS FOR BLOCK MACHINES, PIPE FORMS, "VIBRATED" CONCRETE TABLES, AND WHEREVER EXTERNAL VIBRATION OF CONCRETE FORMS IS DESIRED.

WRITE FOR CATALOG 48 DESCRIBING THE COMPLETE LINE OF "BRANFORD" PNEUMATIC VIBRATORS AND ACCESSORIES.

1915 BRANFORD VIBRATORS U.S.A.

NEW HAVEN VIBRATOR CO.
145 CHESTNUT ST., NEW HAVEN, CONN.

save time . . . save money with EHRSAM ELECTRIC MANLIFTS



Rapid, inter-floor transportation for your employees means more productive time. More production means more profit. Illustrated here is the electric operated, cage-type manlift made in 300 lb. and 500 lb. capacity. Other types available. Reasonable installation costs bring you real savings. Write today for complete information.

THE J. B. EHRSAM & SONS MANUFACTURING COMPANY
ENTERPRISE, KANSAS

Do 4 Days Work in 3 with a "new standard" JAEGER . . .

On an excavation contract for 1,600,000 yards of approximately 60% limestone and sandstone rock, on U.S. Route 22 east of Pittsburgh, Ralph Myers Construction Co. replaced a good 500 ft. compressor with a "new standard" Jaeger 600 and immediately increased daily footage 35% to 40% with the same two wagon drills.

"I'm doing as much drilling in 3 days as I used to do in 4," says Ralph Myers, who now owns two Jaeger 600's.

You can get a comparable increase in production with any "new standard" Jaeger Air Plus. Your air tools need more air than they did back in 1932, when the old 60 to 500 ft. compressor ratings were established. Jaeger gives you that 15% to 20% more air in every model from 75 to 600 ft., insures steady 90 lbs. pressure at the tools instead of 70 lbs., increases your daily production 30% to 40% *with the same men and tools.*

"New standard" ratings are 75, 125, 185, 250, 365 and 600 ft. See your Jaeger distributor.

THE JAEGER MACHINE CO., Columbus 16, Ohio
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CONCRETE and BITUMINOUS PAVING MACHINES

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ESTABLISHED 1857
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Lime Association

(Continued from page 124)

development program of the National Lime Association is maintained steadily on a long-range basis, lime markets should increase and the industry should grow. This statement seems perfectly justified in view of the several new promising markets for lime that are still in their infancy, but which require research and development work.

Plant Operations

The National Lime Association in the past, like most Associations, has had new programs create considerable initial interest and then, after much fanfare, die. One comparatively recent program that appears to be no "flash-in-the-pan" is the Operating Division of the National Lime Association. The fifth such meeting of this group was recently held in Chicago on November 4, 5, and 6, 1948. The first program to consider problems of plant operation was held in connection with the N.L.A. annual convention in March, 1946. Total attendance at some of these meetings has been surprisingly high, nearly as great as for the general conventions.

Operators attending these meetings have openly admitted receiving new cost-saving ideas from their participation and they emphatically want this type of meeting continued. As those attending become better acquainted and develop more confidence in each other, the meetings should become correspondingly more fruitful for those participating. By pooling production ideas in this manner those attending cannot help but improve their respective plant efficiencies. An idea picked up at these meetings that lops off only a dime per ton of lime can make association membership an extremely profitable investment. If these meetings become progressively better, those not attending may well find themselves lagging behind in the art of burning lime.

N.C.S.A. Convention Program

NATIONAL CRUSHED STONE ASSOCIATION will hold its 32nd annual convention February 7-9 at the Hotel New Yorker, New York, N. Y. President W. S. WESTON, JR., will report on business conditions during 1948 and outlook for 1949 at the opening session. GENE FLACK, president, National Sales Executives Association, will present an address of particular interest to salesmen. A greeting luncheon will be held at which DR. NORMAN VINCENT BEALS, minister, Marble Collegiate Church, New York, will speak on "Successful Living." The afternoon of February 7 will be devoted to discussion of operating problems.

On February 8, E. F. Kelley, chief, Division of Physical Research, Public Roads Administration, will discuss "Some Factors Which Affect the Performance of Asphaltic Concrete Pavements," and ISLAND STOWE, foreign correspondent, will cover "Meeting of the Soviet-American Crisis." In the afternoon the following will be discussed: "Significance of Recent National Elections" by JAMES W. DOUTHAT, executive assistant, National Association of Manufacturers; "Special Uses for Crushed Stone" by A. T. GOLDBECK, N. C. S. A. engineering director; and "U. S. Corps of Engineers Approach to More Durable Concrete" by JESSE R. GILBERT, Concrete Division, Corps of Engineers.

On February 9 in the morning the following will speak: H. W. LEGRO, chairman, Committee I, Roadway and Ballast, American Railway Engineering Association, on "Problems in Railroad Roadbed and Ballast Maintenance"; JOHN C. GALL, Washington attorney-at-law, on "Federal Regulation of Pricing Methods and Policies"; and AUSTIN J. TOBIN, executive director, Port of New York Authority, on "The Idlewild Airport." CORD MEYER, JR., president, United World Federalists, Inc., will discuss "World Government" at the day's luncheon. The afternoon session will feature: B. D. TALLAMY, superintendent of Public Works, New York, on "Vibrations from Short Delay Blasting"; and JULES E. JENKINS, Vibration Measurement Engineers, Chicago, Ill., on "Vibration Effect of Burden and Spacing with Short Delay Firing."

PULVERIZERS

Have you investigated our new BRADLEY HERCULES MILL?

Unquestionably the last word in Ecomony and Simplicity.

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BRADLEY PULVERIZER CO.
ALLENTOWN, PENNA.

UNIVERSAL
Vibrating Screens

The all-around productive efficiency of these Screens is widely recognized.

Rugged, economical and efficient, they're your best bet for satisfactory screening!

Get acquainted with their design; write today for catalog No. 107 on Screens and Screening.

Type "Mr" 42"x96" Double Deck

UNIVERSAL VIBRATING SCREEN CO.
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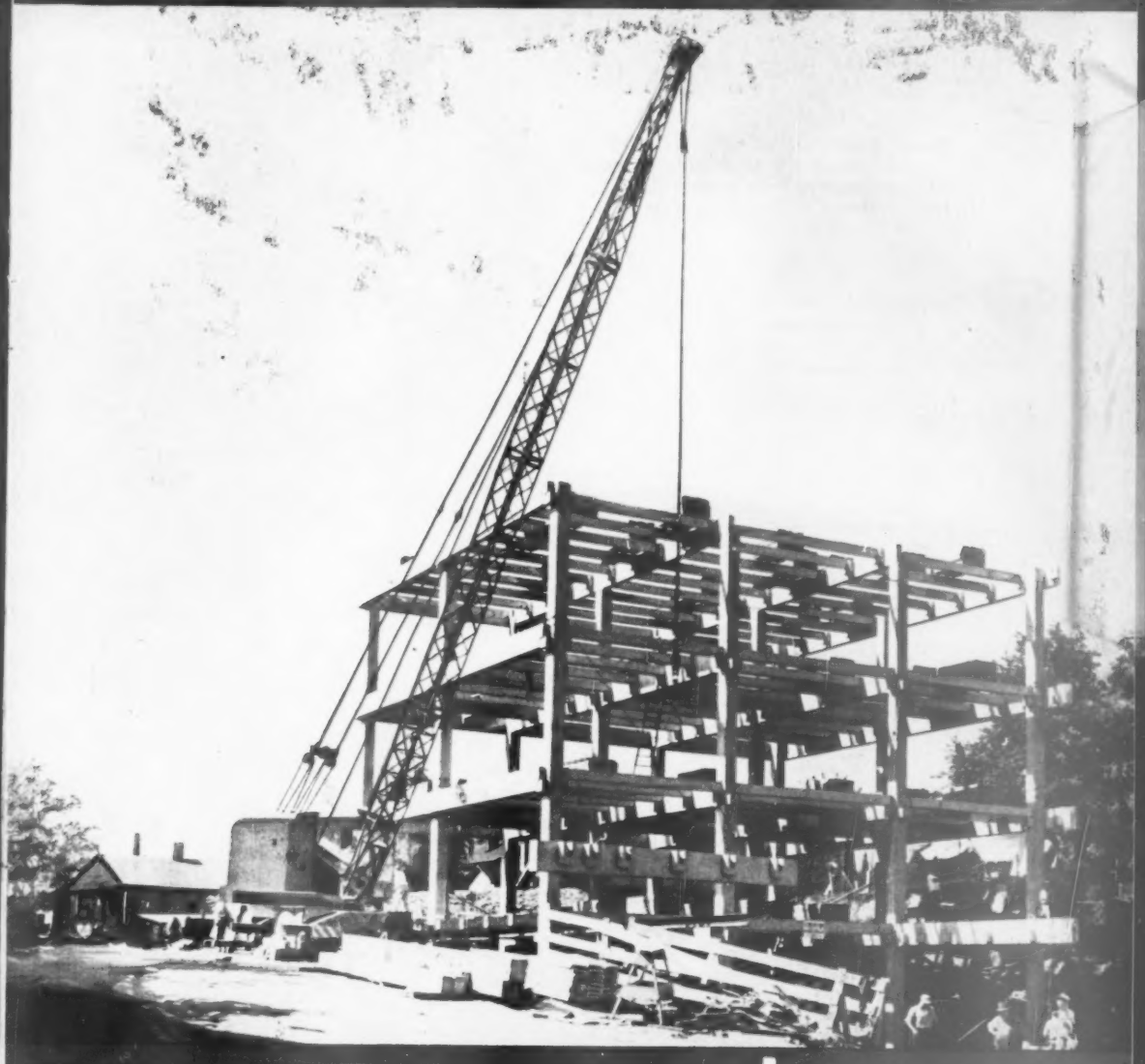
CONCRETE PRODUCTS

CONCRETE UNITS - READY-MIXED CONCRETE



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ROCK PRODUCTS

Greater water-resistance in products made with DURAPLASTIC

Lower absorption of water... higher resistance to passage of water. These are characteristics essential to superior concrete products. They are common to products made with Atlas Duraplastic cement.

With Atlas Duraplastic, slightly more mixing water may be used than with regular cement. For machine-made products—block, pipe, drain-tile, brick, silo staves, etc.—this is of special advantage. It provides a damper, more cohesive mix that holds together better. Finished units are more compact and exhibit higher resistance to the absorption and penetration of water.

For superior concrete products at no extra cost, use Atlas Duraplastic cement. It complies with ASTM and Federal specifications; sells at the same price as regular cement; no unusual changes in procedure are required. Send for further information. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

OFFICES: Albany, Birmingham, Boston, Chicago, Dayton, Des Moines, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

CP-D-78

ATLAS DURAPLASTIC

TRADE MARK REG. U. A. C. CO.

AIR-ENTRAINING PORTLAND CEMENT

MAKES SUPERIOR CONCRETE PRODUCTS AT NO EXTRA COST

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—ABC Network*

INDUSTRY NEWS

N.R.M.C.A. Engineering Building

CONSTRUCTION is proceeding rapidly on the new engineering building at the University of Maryland, where the National Ready Mixed Concrete Association will have a laboratory, and where other engineering laboratories will be quartered.

Washington Block Producers Meet

WINTER MEETING of the Concrete Products Association of Washington was held November 12, 1948, in Tacoma, Wash., with concrete pipe and block manufacturers of Oregon and Canada as guests. Approximately 100 were in attendance. GEORGE P. DUECY, president of the Association, opened the business session by welcoming members of the staff at the Washington State College, University of Washington, American Concrete Pipe Association, Portland Cement Association, Washington Department of Highways and the City of Tacoma Public Works.

HOWARD F. PECKWORTH, managing director, American Concrete Pipe Association, Chicago, Ill., reported on the continually increasing demand for concrete pipe in all lines of construction, and outlined activities and research projects of the American Concrete Pipe Association, an important phase of Association work. A. P. BLAIR, industrial relations specialist, Portland, Ore., spoke on "Labor Relations Pattern for 1949," covering the trend of labor relations with regard to management, labor and government in the field of business.

ROBERT E. TOBIN, manager of the Spokane office, Portland Cement Association, discussed masonry developments, describing how special types of masonry block have become a great asset to the building industry. F. M. Kettenring, Seattle, and C. S. Seabrook, sewer engineer for the City of Tacoma, discussed the advantages of having records of tests and inspection of pipe. Various committee reports were given including the "Pumice Research Progress Report" by J. J. WEGNER, Division of Industrial Research, Washington State College, and "Irrigation Pipe Studies" by J. A. ROBERSON, Washington State College. The program was concluded with a social hour and general discussion. Committee on Arrangements consisted of Bert E. Harrison, chairman, and E. L. Warner, James Lundberg, Charles Delling, W. S. Wilson and Verne Frese.

Low Cost Home From Concrete Slabs

PETER J. MINCK, president, Fire-Proof Construction, Inc., Columbus, Ohio, has designed a concrete slab, carrying the trade name Mink-Crete, which is being used in constructing small, low-cost homes in a minimum amount of time. The slabs, 2-ft. wide and 9-ft. long, are in a box formation. The wall of the box is 6-in. deep, with a 4-in. space for electrical wiring, or insulation if desired. The slabs are bolted together.

Floor, walls and roof of the house shown in the illustration were installed in a day and a half. The roof is gable design. Slabs were also used for closet walls, porches and sidewalks. Concrete block was used in the partitions. By bolting a furring strip to the inside of the slab, any type of wall covering can be used.

Mink-Crete slabs are made in steel forms using sand and gravel aggregate. The forms are vibrated during manufacture and slabs have a smooth outside surface.

House constructed of concrete slabs. Floor, walls and gable roof were installed in less than two days

UNITED CONCRETE PIPE CORP., Los Angeles, Calif., has established a pipe yard in Los Banos.

GIBSON'S CONCRETE PIPE CO., Delano, Calif., in a recent fire, lost a garage and one truck, and had 8 other pieces of mobile equipment damaged.

BIRD BLOCK CO., INC., Frankfort, Ind., now carries the name Perry Concrete Products Co., Inc., with Wayne Perry as sole owner. Previously the plant was owned and operated by Wayne Perry and Stan Evans.

CONCRETE PRODUCTS CO., Nashua, Iowa, originally started as the Brickblock factory, is now being operated by N. T. Fosse who is planning a general line of concrete products, with emphasis on drain tile.

LEFLER CONCRETE BLOCK CO., Charlotte, N. C., has installed new equipment which has doubled plant capacity. A variety of concrete products are manufactured in addition to block, including drain tile at the rate of 2500 per day.

DISHMAN CONCRETE PRODUCTS, INC., Dishman, Wash., has been incorporated by Edward J. Schun, Sr., and others, with a capitalization of $40,000.

CAROLINA CONCRETE PRODUCTS, INC., Lancaster, South Carolina, has been granted a charter to manufacture and sell concrete block. Capital stock is $40,000. D. H. Jernigan is president of the firm.

POYNETTE BLOCK & CEMENT PRODUCTS, INC., Poynette, Wis., has been incorporated with 2500 shares, par value $10, and a minimum capital of $500, by Frank and Jeanne Geiger and Rose Caruana.

SALINA CONCRETE PRODUCTS CO., Salina, Kan., has launched an improvement program at the plant to increase production and yield higher quality products. New machinery to be installed includes a Stearns Jolt-Crete block machine and electric fork lift trucks. The steam kilns are being rebuilt with a vent system. The plant, with five kilns, has a capacity of 4000 block per day. Carl Engstrom is vice president and general manager.

CONCRETE MASONRY MANUFACTURERS ASSOCIATION of Southern California, with headquarters in Los Angeles, has made arrangements with the Merchants and Manufacturers Association whereby members of C.M.M.A. may obtain counsel and advice on any problems relating to employment relations, law and bargaining service.

HANLY AND SON CONCRETE PRODUCTS, have opened a new plant in Waycross, Ga., specializing in the manufacture of concrete pipe, septic tanks, well curbing, concrete door steps, lawn furniture, foundation piers and farm items. E. B. Hanly and E. B. Hanly, Jr., own and operate the plant.

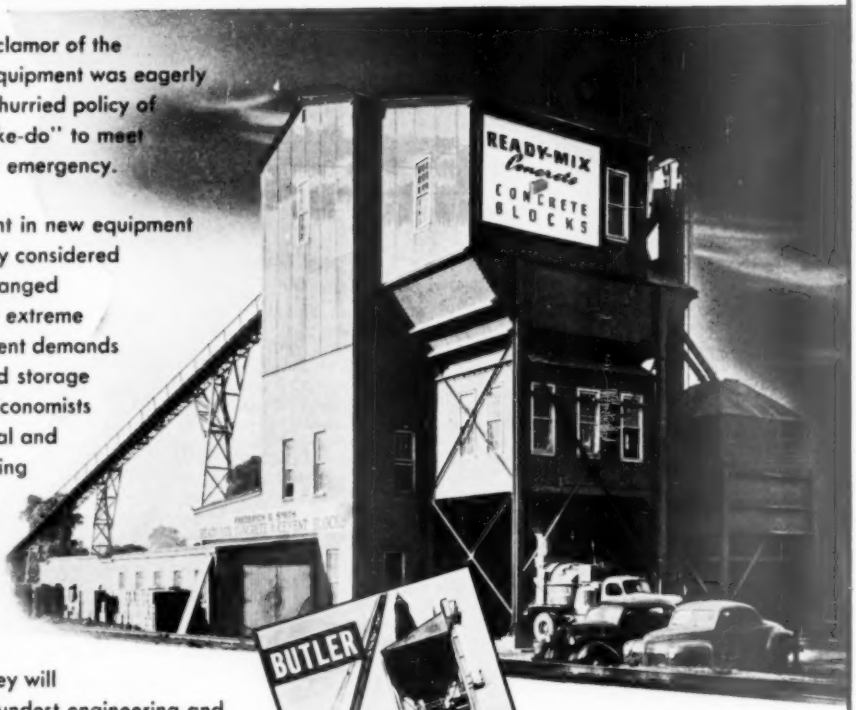
FIFTY concrete silo manufacturers of the upper Midwest met recently in Minneapolis, Minn., for a conference and business session.

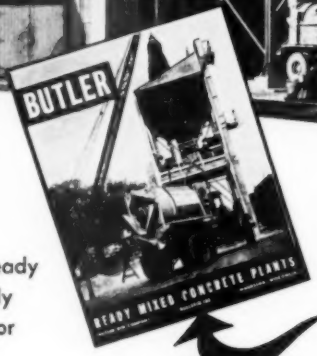
now that every dollar counts

BUY WISELY-BUY BUTLER

In the rush and clamor of the war days any equipment was eagerly accepted, — a hurried policy of "patch and make-do" to meet the demands of emergency.

Today investment in new equipment must be carefully considered in the light of changed conditions. The extreme shortage of cement demands greatly increased storage capacities . . . Economists foresee a gradual and healthful tightening of money. It is increasingly important that your equipment dollars be placed where they will bring you the soundest engineering and the highest daily production at the greatest possible saving in man-power.





That many in the Concrete Products and Ready Mixed Industries know these facts is clearly shown in a continued high level of orders for BUTLER ENGINEERED DESIGN IN BUTLER-built equipment.
Plan your purchases ahead so deliveries coincide with your needs. It's worth it — for "buying BUTLER" will keep your operations firmly in the profit column.

AN AID IN YOUR 1949 PLANS

To help you in planning your equipment program BUTLER BIN has prepared a profusely illustrated catalogue, (44 pages) showing how BUTLER ENGINEERED DESIGN has successfully met a wide variety of conditions and problems in Ready Mixed Concrete plant planning and construction. Just ask for your copy of Bulletin 185.

BUTLER BIN COMPANY

WAUKESHA, WISCONSIN

"We've Standardized On Blue Brutes"

Millard Buzby Epley, Treasurer of Buzby Brothers, Westville, N. J.

Buzby Brothers' profit-boosting fleet of Ransome Blue Brute Hi-Up Truck Mixers at their batching plant in Westville, N.J. The three 3-yd. Mixers at left, bought in 1946, proved so satisfactory that the other five Hi-Ups were added—two in 1947 and three in 1948.

Here's how Ransome Blue Brute Hi-Up Truck Mixers rate with men who use them constantly. Millard Epley, Treasurer of Buzby Brothers, writes:

"All our Hi-Ups have had an absolute minimum of down time. Non-availability has never cost us a penny.

"Every Mixer must be on call for any size and type of job, at any hour. Ransome's quick charging action at the plant, thorough mixing en route and fast discharging at the job allow us to average nearly 200 yds. a day on six-or seven-mile hauls.

"I believe Ransome's better mixing action makes stronger concrete — I know all our customers are satisfied.

"Due to Ransome's A-1 service and the excellent operation of our Hi-Up Mixers, we have found it profitable to standardize entirely on Blue Brutes."

Get around among Hi-Up users and you'll find this is a familiar story, with smooth-running, efficient Blue Brute Truck Mixers saving time and money on every job. Write for Bulletin 221, or see your nearby Worthington-Ransome Distributor for full proof that *there's more worth in Worthington.*

WORTHINGTON

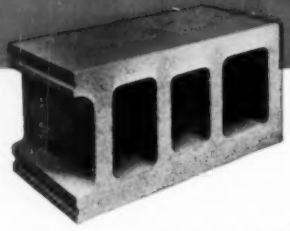
WORTHINGTON PUMP AND MACHINERY CORPORATION
Worthington-Ransome Construction Equipment Division, Holyoke, Mass.
Distributors in all principal cities

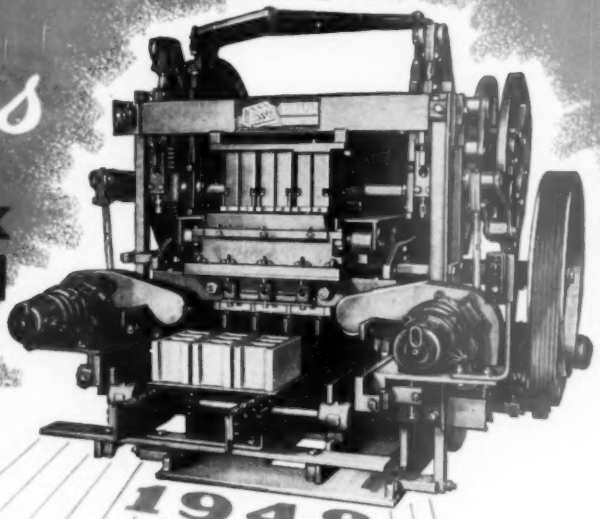
Fast action! One of Buzby Brothers' 3-yd. Hi-Ups, pouring concrete flooring for a new warehouse at Gibbsboro, N.J. This job, 10 miles from the batching plant and totalling 51,000 sq. ft. was completed in 13 days.

Buy Blue Brutes

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

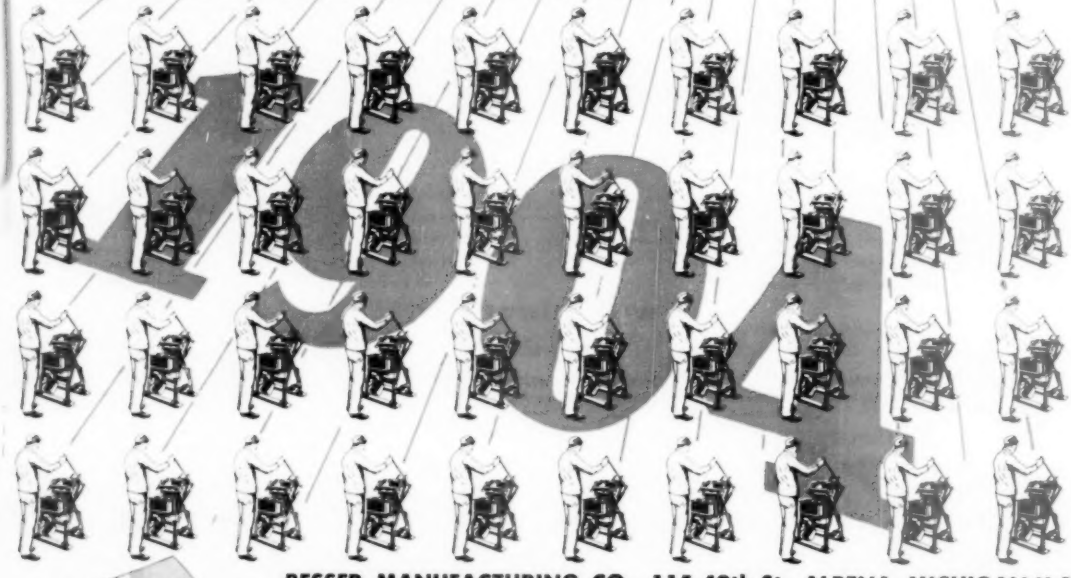
Progress
IN CONCRETE BLOCK PRODUCTION





1948

It is an impressive fact that today One Besser Super Vibrapac machine produces more Vibrapac Concrete Block than forty hand-operated machines produced in 1904. Besser Engineers have developed and perfected concrete block machinery to a point where each unitized Vibrapac is a modern, dynamic production line. Hand labor has been reduced to pushing a switch button and guiding a power off-bearing hoist.



BESSER MANUFACTURING CO., 115 49th St., ALPENA, MICHIGAN U.S.A.

Complete Equipment for Concrete Products Plants

ONE SET of PLAIN PALLETS for ALL SIZES of UNITS

BESSER *Super* VIBRAPAC

CONCRETE INDUSTRIES

To Hold High Volume of Business

Sales effort the key to holding concrete block volume to billion unit per year level. Ready-mixed concrete producers predict good business but note tendency to more caution in construction planning

REPLIES TO OUR LETTER to producers of concrete products and ready-mixed concrete, requesting opinion as to the possible effects of the national election on business' prospects for 1949 and asking an appraisal of the outlook generally, indicate that 1949 will be another peak year.

The industry is beginning to feel that some adjustment in prices and profits — a levelling off — is not too far in the future, however, and there is the very healthful sign, at long last, that merchandising is to be given some attention. Many of those who anticipate 1949 volume equal to 1948 business say that honest-to-goodness sales effort is going to be the means to attain that goal. They are experiencing signs of a buyers' market returning in their particular marketing area. In this regard it is commendable that the National Concrete Masonry Association is inaugurating an ambitious program to aid industry in aggressively merchandising its products.

Not only is there indication of a return to a buyer's market in some localities, but stiff competition is being felt by established producers from plants that have been equipped with new and efficient machinery. Labor costs and high freight rates are having some ill effects, as in all industry, and the availability of cement in 1949 is cause for concern.

Concrete Products

A letter received from George W. Katterjohn, president of the National Concrete Masonry Association, is reproduced here because he bases his forecast on contacts with fellow concrete products manufacturers over the United States. Mr. Katterjohn wrote as follows: "Predicting, according to the results of our recent national election, does not seem to be very popular at the present time, however, it is my opinion that the concrete masonry industry will again outsell the entire masonry field in 1949.

"This is based on a 20,000-mile inspection tour of products plants over America and meetings with architects, contractors and government groups.

"Light type of building will possibly show a slight volume decrease but the difference will be made up in heavy construction.

"The American concrete products producer is ready for any challenge. Our plants have been exceptionally well maintained, capacities increased, and they are efficiently managed. The hovering ghost of course is going to be—cement shortage. Given this 'magic power,' the concrete masonry industry can and will supply the demand which I believe will again reach 1,000,000,000 units."

A Wisconsin producer, who specializes in diversification of concrete products, expects full capacity production for at least the first six months of 1949. He said:

"We are not prophets. From our own bookings, we have enough orders to keep us going to capacity for the first six months of 1949. From there out we do not know and cannot foresee the prospects although we expect there will be some business."

A Challenge

AFTER several consecutive years of record-breaking business due to demands that far out-stripped supply, the concrete products and ready-mixed concrete industries in some areas are about to face a buyer's market. If not actually a buyer's market as such, some of the reports herein indicate that purchasers are becoming much more cautious in making plans and expenditures for new construction.

A new era of merchandising is at hand which will determine how successful these industries will be in retaining the enormous gains they had accomplished during the past post-war years when demands for all building products were enormous, and supply of competitive materials was scarce.

Concrete products have had a rare opoprtunity to demonstrate their advantages over competing products and now, it is up to the industry to insure these expanded markets for the years ahead through salesmanship and promotion. There are far too many who have been content to fill orders without concern for the future; let them heed the warning that competition lies ahead as pointed out by other members of their industry.

THE EDITORS

From Central Michigan, we received the following optimistic comments: "We are just optimistic enough to believe that if we think, act, and work on a high level it will have a tendency to counteract pessimistic views.

"Personally, we intend to go ahead and stock up thinking there will be as big, if not a bigger building program next year than what we have already seen. We feel that some way should be found to bring the cost down for a home for the average family. Yours for more optimistic views regardless of politics."

The return of competitive selling is anticipated by a small-town Kentucky producer who wrote: "I believe that 1949 should be a better year than 1948. The government program should advance without any delay and will be extended from its 1948 level. Some price adjustment will be made and competition will be much greater as new and old companies acquire new equipment."

A large Detroit, Mich., producer who anticipates stimulated home-building, wrote thus: "Regarding prospects for business in our line for 1949, we feel that as soon as Congress meets, legislation will be put through which will make it possible to finance the construction of a large number of houses in the $7500 to $8500 range. This would mean a great deal of activity for the concrete products business.

"From a percentage standpoint, we feel that 1949 should be almost as active as 1948 but it looks at the present time as if the early months will be slower than the same months of 1948."

A slight decrease in general business but an increase for concrete products was reported from a Minnesota community, as a result of a resumption of selling effort. Our correspondent commented as follows: "We feel that business in general will show a slight decrease during the coming year. Insofar as our business is concerned, we anticipate an increase in volume of about 10 percent over 1948. We are basing this on the fact that we have a backlog of orders that will take our full production until about June 15, 1949. This backlog accumulated without any effort on the

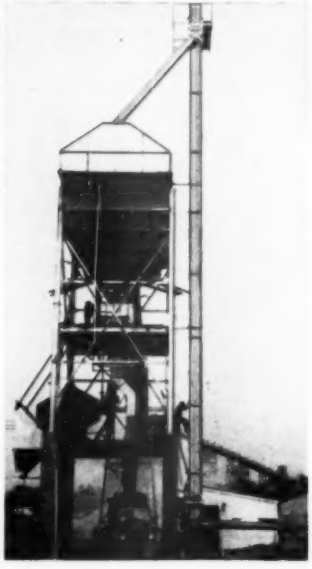
(Continued on page 136)

Above: This attractive new material distribution center, ready-mixed concrete, right, and aggregates, left, is the new Sacramento plant of Pacific Coast Aggregates, Inc.

New Plants

Above: Plant of Aurora Redi-Mix Concrete Co., Aurora, Ill. that features Butler bins and weigh batchers. Drum-type, transit-mix truck is loading under plant. Smith tilting mixer charges non-agitating-type delivery trucks at right side of plant. Bulk cement is delivered from rail hopper to bucket elevator by screw conveyor, lower right. Aggregates are elevated to hoppers by belt conveyor out of view behind plant. The structure has been completely housed for winter operation subsequent to the taking of this picture

Right: ready-mixed concrete plant of Utah Sand and Gravel Products Corp., Salt Lake City. Truckway to left is for charging trucks with premixed concrete; in center transit-mix trucks receive dry-batched materials; and the truckway to right is for future expansion



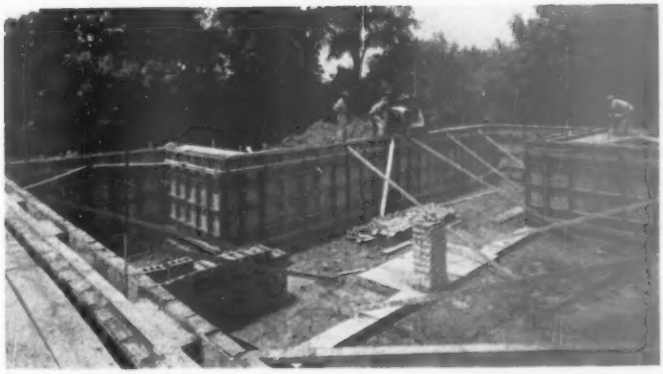
Left: Transfer, stacker belt combination at new plant of Imperial Ready Mixed Concrete, Chicago, Ill. Aggregates are collected on short transfer belt from rail hopper (out of picture, left) or from truck hopper, extreme left, for transfer to inclined conveyor. A second Barber-Greene conveyor has recently been installed that connects directly to the top of the plant from a second track hopper at point where picture was taken. Bulk cement is delivered to bucket elevator at right of silo by screw conveyor from track hopper. Silo is for storage of air-entraining cement at this operation which maintains fleet of non-agitating type equipment exclusively

New Ideas

Right: Covered storage area, background, of Hart Concrete Products Co., Tampa, Fla. Distributing conveyor just under roof receives aggregates from bucket elevator, center. Aggregates are reclaimed by belt conveyor in tunnel under storage piles

Left: Fork truck loading block to Pike semi-trailer at concrete products plant of Rocklite Products, Inc., Ventura, Calif. These haulage units permit the company to serve a market 500 miles in diameter

Left: This Elwell-Parker electric lift truck handles 90-block racks from the Besser Vibrapac block machine to curing rooms. Note simple controls in front of operator



Right: New idea in forming system for poured concrete developed by Symons Clamp & Mfg. Co., Chicago, Ill. Essentially it is a panel form system in which panels as well as ties are held in place by the same wedge bolts. The manufacturer claims that these forms stand repeated usage due to the fact that no nails are needed in their erection, thus saving splitting of the wood

part of our salesmen. These men have assured us that if we give them the go ahead signal, they will be able to secure enough orders to consume our entire production for the balance of 1949. We have taken on additional help here at the plant, enabling us to increase our production approximately 10 percent."

A need for full volume construction is seen in the area just north of New York City, according to a producer of a diversified line of concrete products, who commented: "A need for full volume construction still exists in this territory. If labor can be persuaded to produce, and the prices of some building materials be lowered, our volume for 1949 should equal or exceed that of 1948."

Concrete pipe business will increase and concrete block volume will hold the line in 1949, says a producer in southwest Missouri. He said: "We manufacture heavy concrete, haydite and cinder building block, and concrete culvert and storm sewer pipe.

"Our block business was off approximately 30 percent from business in 1948, while the pipe business was up about 40 percent. Numerous increases in the prices of materials, freight rates, and skilled labor in the field is the main cause of the slump in use of building block. Although there have been increases in the prices of materials and freight rates in pipe production, this product is mainly consumed in public work projects, such as federal and state highways, municipalities, where cost increases are not so sensitive.

"Costs are rather steady, but sales are getting bumpy indicating a leveling off or a change in this territory.

"For 1949, we do not look for any increase in the block business, but we do look for some more recession until costs get down to where people feel they can afford to buy. In pipe, we look for a steady market with a 20 percent increase in sales for 1949."

Uncertain conditions will prevail in 1949 in northern Minnesota according to a manufacturer of concrete silos. He said: "Our outlook for 1949 is very uncertain. Conditions have slowed up in general the past two months. The active buyers in the rural districts do not seem to have programs for 1949. In fact they state that labor demand per hour is too great to warrant programming for construction."

Conditions in the concrete pipe industry are summed up in the following by an official spokesman for the industry: "I would say that we look forward in the concrete pipe industry to a year in 1949 about comparable with 1948, and 1948 is the best year the industry has ever had. In 1948 our production has been limited only by the supply of steel and cement which we could obtain.

"Although my figures have not been completely assembled, I think that in 1948 we will have made in this country about six and three-quarter million tons of concrete pipe. From a geographical standpoint it does not seem that any one section of the country is doing much better than any other section, although in our north industrial states production during the hard winter months falls off considerably due to the weather whereas in the south and along the west coast production is not so materially hampered by the weather in the wintertime."

Volume of business in 1949 will equal that for 1948 according to a manufacturer of concrete pipe with several plants in the midwest. Comments were as follows: "I will say that our view is that business in most lines including our own has gained such a high velocity that there will be no decided slowing down until at least the end of 1949. We do not expect our business to show much increase or decrease during 1949."

An appraisal from the far west by one of the regional concrete products associations read as follows: "As far as we can see, the unexpected turn of the national election was not so unexpected to a majority of the voters. Admittedly, it was a surprise to business generally.

"As far as can be seen at the present time, I believe it is the thought in this area, that for the short pull, business will continue to be good. I have also heard the thought expressed that the incoming administration will make a particular effort by support, or subsidy, to keep business good, whereas, a change in the administration would probably have brought about a condition of leveling off sooner.

"I believe it is the thought of most of the products people, as of other business men in the area, that the longer we go without some leveling off in business, the worse it will be when it does come."

Some of the other comments were as follows:

From New Jersey (Concrete Block): "From contacts with the largest concrete products producers in the South Jersey area up to date there are no stockpiles accumulating. There is a general air of waiting to see what the new administration will do. Sales in stores have been slackening since election day.

"The average buyer appears to sense a tight money situation in the near future. Possibly there will be a drop in home construction in 1949 of 40 percent from 1948 volume."

From Indiana (Concrete Products): "I would like to say that I think one fellow's guess is about as good as anothers on what will happen. I also would like to say that as far as the results of our national election are concerned, I doubt if it will make any difference in volume of business, but I do have in mind that it might make some difference on what will happen in the way of compensation for our efforts put forth.

"As far as we are concerned, we are laying our plans for at least the same amount of business for 1949 as we have had in 1947 and '48. Our prospect here looks as good or better now for next year than they looked at the same time in 1947 for the year 1948. We have a number of men in the field and we have our sales meeting each Saturday morning. The writer has a habit of making memos at these meetings and makes comparisons from year to year and as nearly as we can figure, our sales next year should be as great as they have been in the past and we were considerably over 1947 volume in 1948."

"Of course, we are going to admit that we tried to get on the ball and put some pressure on our sales organization to go out and get the business in 1948 which we did not do in 1947 on account of the shortage of material. We are also aware of the fact that we have tried to relay to our salesmen that the business is going to be there for us to get in 1949 if the sales effort is made in the building material line the same as it is in other lines of merchandise. We honestly believe that we will do as much business in the coming season as we did last year."

From Illinois (Concrete Block): "It is my opinion that we will have as great if not greater volume of business in 1949 as we had in 1948, and this is based on the following facts: There is still a great demand for lower-cost housing rentals or sales in our territory. The greater volume of our block material is used for this type of construction. I cannot see any let up in the volume of our material being used in 1949."

From Missouri (Concrete Block): "Our prospects for the year 1949 look to be as good as 1948 has been. We have sufficient business contracted ahead to give us confidence in making this statement.

"The government is inclined to encourage, through liberal financing, the construction of low-cost housing. It is possible to build economically with the materials which we manufacture and with proper promotion efforts sales should be very satisfactory."

From Michigan (Concrete Block): "The Democrats are continued in power by the last election. They have been in power nationally since 1932. Since 1936 the farmer, the laboring man and business have had plenty good times. We see no reason why the continuance of this party in power should do anything but to continue the good times.

"The outlook for the construction business in this area for 1949 continues good. State paving and city and county paving should be in larger volume in 1949 than in 1948. Commercial building will probably not be quite as good. Institutional building will be better. For house building, it is expected that the 1949 Congress will do things that the Republicans of 1948 failed to do. If this is true, the house building program will be better

in 1949 than in 1948."

South Carolina (Concrete Pipe): "We anticipate the same volume for 1949 as in 1948."

Indiana (Concrete Block): "Locally I see no severe effects that the election will have on our business. The backlog of construction projects is very high due to the shortage of cement this year. This shortage merely postponed until next year a lot of projects which had been planned for this year.

"I believe the prospects for concrete products in the future are very bright. Resistance hereabouts is disappearing due to the price and quality of lumber and the ultimate cost of frame construction units. Proof has been given of the permanence and comfort of such homes. Our business looks exceedingly good for 1949 provided we can get cement to work with."

Iowa (Concrete Pipe): "I expect that volume of business will hold its own in 1949."

Ready-Mixed Concrete

Producers of ready-mixed concrete reported essentially the same prospects for business as forecast by concrete products manufacturers. A few of the comments follow.

From Wisconsin: "Our business outlook is about the same for 1949 as 1948. However we hear some talk that the mills (paper) are in doubt about expansion at the present time which might make some decrease later in the summer of 1949."

From Missouri: "We do not feel that the election will affect business locally, inasmuch as this section is solidly Democratic anyway. Tampering by Congress with existing labor laws can cause us trouble but we do not anticipate that there will be legislation to be enacted early enough in the year to cause trouble. Revision of minimum wage laws will help if enacted as we are now paying more than the scale and such laws may force our competition to higher wages, hence narrowing the spread between us. While our business will probably be good next year we doubt that it will surpass 1948 volume which has been unusually good locally."

From California: "I am in the ready-mixed concrete business. I have a very local operation in San Francisco. I am not a Democrat and did not vote for Truman.

"I feel with many others that there is a falseness about our recent prosperity which cannot help but end in economic disaster and chaos. Nevertheless, I believe, that all things considered, we will find our business in 1949 not very different in volume from 1948. What Congress does with taxes will determine net profits and volume in subsequent years."

From Ohio: "After the terrific let down of forecasters in the election it seems to me you are expecting a lot to request a forecast at this time.

"However, in the light of what I hear from trade and bank conversations I am expecting 1949, in the building industry, to be at least as good as 1948. There is not a quantity of large construction in sight in this territory unless some of the much contemplated public work materializes."

From Colorado: "There are many construction projects planned in this area for 1949, and I believe that the volume of business should continue to be high, although perhaps lower than in 1948. While the availability of construction and mortgage loans may affect the number of projects that will actually be started, and the almost certain rise in costs of labor and materials may also have somewhat adverse effect on building, there remain enough projects that are needed and cannot be postponed, to keep the construction industry hard at work.

"One of the most immediate results of the election was the dispelling of much of the optimistic attitude of business men. There will be severe scrutiny of expansion and building programs and doubtless elimination of most non-essential work. But besides the continued demand for homes and apartments in this area we have also a program of municipal building and a large one for the public schools. Churches, warehouses, business blocks in newly developed residential districts, and commercial enterprises all are going ahead at a good pace.

"It is suggested that new oil income in this region will flow into our area and stimulate building. I hope so. Unless an oil boom materially changes the situation, I believe that we shall have to work harder in 1949 for the business we get and really sell rather than merely take orders. Competition is becoming keener, and our customers are watching nickels on the price. This, I realize, is a very general statement. All I know about 1949 is that we are going to be in there pitching."

From Indiana: "As to the unexpected turn in the national election, I do not believe that it will change the outlook for business except the hold that labor will have. It is almost a known fact that this Congress is going to be more favorable to the unions which in my estimation will hold off a depression and will also increase this inflation era we are in.

"As to local business or building and construction I am expecting the same amount as this past season, which was all that we could handle with our present equipment. There is to be a large public project in the coming season here which will increase our sales almost one-half more, but this is only a local condition."

From Massachusetts: "The ready-mixed concrete output for the first six months of 1949 should show a 20 percent increase over the first six months of 1948. This prediction is based on the present back-log of unfilled orders plus a great many projects not yet awarded."

From Kansas: "In our particular area, I believe that our condition is somewhat unusual in that we have an air base at the outskirts of the city while we have a large building program starting at the fiscal year. We in turn expect a good business both in our ready-mixed concrete as well as our masonry department. However, if this program does not materialize, we are in question as to how volume would compare with that for 1948.

From New York State: "The past season has been the best we ever had and we feel that next year will be equally as good. Ours is a rich farming area with numerous towns which have paper mills and others with milk processing plants. The farmers have had high earnings for some time and they account for 60 percent of our sales. We have been in a position to deliver ready-mixed concrete since 1932 and supply a major portion used in our trucking area. The mills are all good customers and have a constant demand for repairs and expansion.

"The large industries are about taken care of, but several large buildings are in the offing which will offset this loss. Home construction which is going along very well takes most of our concrete block and indications are that next year will be even better than this year.

"Our only difficulty is to get cement in sufficient quantities to meet our requirements. From Sept. 1st to Dec. 1st, 1948, we operated at 75 percent of capacity due to short supply."

Lightweight Aggregates

Manufacturers of lightweight aggregates, much of which is utilized for concrete products, are very optimistic about business prospects in 1949.

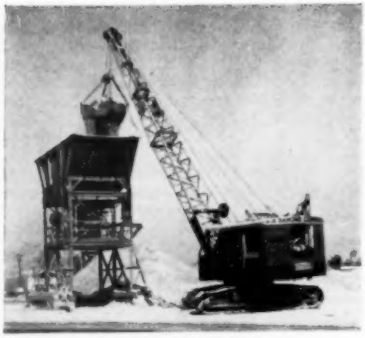
Harry K. Lange, Sales promotion manager, Western Mineral Products Co., Minneapolis, Minn., permits us to quote the following comments: "Our own company, as well as the vermiculite industry as a whole, expect an appreciably greater volume of production in 1949, despite the unexpected results of the national election. The supply of crude vermiculite ore is virtually unlimited; and improvements in mining, milling, and processing equipment will enable both the miners of vermiculite ore and processing distributors to meet already noticeably increased demands for our products.

It is difficult to forecast the volume of 1949 business, percentage-wise, because a number of factors which are relatively new would have to be assessed. During 1948, for example, we had just begun to see the effect of the resumption of large-scale building. This, with the growing trend in architecture toward light-weight design, has accelerated the use of light-weight vermiculite plaster and vermiculite concrete fireproofing. Additional impetus has come from the popularity of basementless type houses and the

(Continued on page 150)

Batching

Batching plant at the right does double duty. It serves a block plant (not shown) that turns out 6000 standard 8's per day and batches 500-cu. yd. of ready-mixed concrete. The operation is built around Heltzel batching and weighing equipment



In the illustration above, note how the batching equipment is protected with heavy wire screens. The 1½-cu. yd. Link Belt Speeder is handling 1400 cu. yd. per day, and is owned by the Blue Diamond Corp. of Los Angeles, Calif.

Above: New batching plant of Beckley & Myers Co., Springfield, Ohio. A Koehring 56S plant mixer and latest type C. S. Johnson Octo-bins are used. Note under-car unloader, lower right

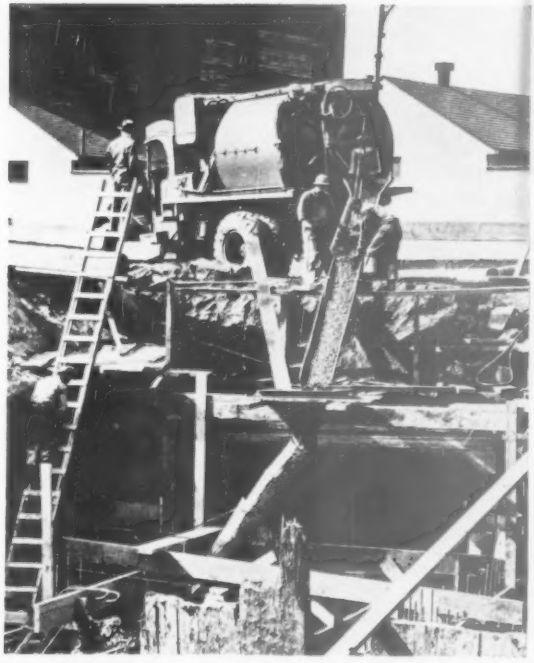
Photograph at the left shows the new batching plant of Kuert Concrete, Inc., South Bend, Ind. This neat looking plant features Johnson Octo-bins and mixes concrete in two, 2-cu. yd. Smith mixers. A truck fleet with 15 Dumpcrete non-agitating bodies does the hauling

Ready-Mix

At left a Wayne crane is handling concrete from a non-agitator truck body on a basement pour. This piece of rubber-mounted equipment is made by the American Steel Dredge Co., Inc., and illustrates use of mobile equipment expediting construction using read-mixed concrete

Where the going is tough producers find that a heavy-duty truck like the Mack, dual-axle drive, model LJ truck does the job. It carries a Jaeger drum-type mixer

At the left is shown a truck-mixer mounted on a two-ton Chevrolet chassis. It was photographed at a Los Angeles, Calif., ready-mixed concrete plant. Note bucket elevator for elevation of aggregate to overhead bins



Shown at the right is an action shot of a Rex horizontal Moto-Mixer which the Chain Belt Co. put into the field this year, and which is the newest addition to its line of truck-mixers. Note the non-segregation characteristics of the concrete being poured

Testing Concrete Drain Tile

Strength and absorption qualities determined through soaking and breaking process

By R. C. MISHEK

A SERIES OF TESTS was conducted by the University of Minnesota School of Agriculture on concrete drain tile manufactured by the Waseca Concrete Co., Waseca, Minn. Professor Dalton G. Miller, who has been awarded the John Deere medal for 1948, and who has been with the University testing laboratory for almost 30 years, was in charge of the testing.

Procedures used to determine strengths and absorption of the tile are described here. The tile is first weighed and the weight recorded for use during testing, after which it is immersed in a tank of water as shown in Fig 1. Such soaking, while a detriment to poor drain tile, does not hurt good tile. The tile remains in the water for approximately 24 hours and is then removed and placed in a testing machine, Fig. 2. Here the weight is adjusted and water put into a pail, and the crank is turned as shown in Fig 3, until the tile is broken, Fig. 4. Now the pail of water is weighed, Fig. 5, and the breaking strength computed.

Fig. 1: Tile is immersed in tank of water

The weight of a tile is a good indication of the strength that it will stand. That is, a tile light in weight will not stand as much breaking load per lineal foot as a heavier tile. Of course it also depends on how the tile is packed. Professor Miller has conducted approximately 10,000 of these tests.

The machine used at the University of Minnesota was designed by the Portland Cement Association with the help of and perfected by Professor Miller. It not only tests for the breaking load per-lineal foot, but also the thickness of the tile walls, also an excellent indication of strength. The specific tile requirements on different classes of drain tile are listed below. (See page 11 A.S.T.M., Specifications for Drain Tile.)

It is not impossible to get strong drain tile. A 6-in. tile tested in May, 1948, from the Waseca Concrete Company, had an unusual breaking strength of 2200 lb.

To make good drain tile it is necessary to analyze the sand as well as the buck-shot or pea rock that is added to the sand. One of the hardest things to control is aggregate. It is recommended that all sand used be washed sand and state-tested. About

(Continued on page 150)

Fig. 2: Tile is placed in testing machine

Fig. 3: Crank is turned until the tile is broken

Fig. 4: Broken tile in testing machine

Fig. 5: Water is weighed and breaking strengths of the tile computed

Internal Diameter of Tile, in.	Farm Drain Tile				Standard Drain Tile				Extra-Quality Drain Tile			
	Minimum Average Ordinary Supporting Strength, lb. per linear ft.	Maximum Average Absorption by Standard Boiling Test, per cent			Minimum Average Ordinary Supporting Strength, lb. per linear ft.	Maximum Average Absorption by Standard Boiling Test, per cent			Minimum Average Ordinary Supporting Strength, lb. per linear ft.	Maximum Average Absorption by Standard Boiling Test, per cent		
		Shale and Fire-Clay Tile	Surface-Clay Tile	Concrete Tile		Shale and Fire-Clay Tile	Surface-Clay Tile	Concrete Tile		Shale and Fire-Clay Tile	Surface-Clay Tile	Concrete Tile
4	800	11	14	12	1200	9	13	10	1600	7	11	9
5	800	11	14	12	1200	9	13	10	1600	7	11	9
6	800	11	14	12	1200	9	13	10	1600	7	11	9
8	800	11	14	12	1200	9	13	10	1600	7	11	9
10	800	11	14	12	1200	9	13	10	1600	7	11	9
12	800	11	14	12	1200	9	13	10	1600	7	11	9
15	1000	11	14	12	1300	9	13	10	1600	7	11	9
18					1400	9	13	10	1800	7	11	9
21					1550	9	13	10	2100	7	11	9
24					1700	9	13	10	2400	7	11	9
27					1850	9	13	10	2700	7	11	9
30	(Not Permitted)	(Not Permitted)	(Not Permitted)	(Not Permitted)	2000	9	13	10	3000	7	11	9
33					2150	9	13	10	3300	7	11	9
36					2300	9	13	10	3600	7	11	9
39					2450	9	13	10	3900	7	11	9
42a					2600	9	13	10	4200	7	11	9

A.S.T.M. Aggregate Specifications for Drain Tile

Concrete Masonry Convention and Exposition

Merchandising, labor relations, operating methods to be considered at Cleveland meeting

NATIONAL CONCRETE MASONRY ASSOCIATION will hold its 29th annual convention, January 31—February 3, at the Cleveland Public Auditorium, Cleveland, Ohio, with GEORGE W. KATTERJOHN, president, presiding at the opening session on the morning of January 31. Tentative plans call for reports of the treasurer, executive secretary, Nobel Award committee, and nominating committee at this time, plus election of directors. DEANE R. LYNDE, Cinder Concrete Products, Inc., Denver, Colo., will speak on "Apprentice Training — How We Helped Develop an Effective Program." There will be no afternoon sessions so that delegates may attend the 1949 Concrete Industries Exposition which will be open from 1:00 to 8:00 p.m.

The following topics will be presented at the February 1 session: "Merchandising Programs for Large, Medium and Small Size Plants" by W. D. M. ALLAN, Portland Cement Association, Chicago, Ill.; "The Merchandising Program of a Company Located in a Small City" by E. E. OSBORN, The Clinton Construction Co., Wilmington, Ohio; "Our Approach to Concrete House Promotion" by R. L. HUMBARGER, Masolite Division, General Dredging Co., Inc., Fort Wayne, Ind.; "A Detailed Outline of a Planned Merchandising Program" by FRED W. REINHOLD, Anchor Concrete Products, Inc., Buffalo, N. Y.; and "Labor Relations—Our Problem and Yours" by VINCENT P. AHEARN, National Ready Mixed Concrete Association, Washington, D. C.

The report of R. E. COPELAND, director of engineering, will be presented February 2, along with two papers: "Promoting Concrete Joist-Concrete Filler Block Floors" by P. M. WOODWORTH, The Waylite Co., Chicago, Ill., and "Prestressed Reinforced Concrete Masonry Walls, Floors and Roofs" by A. G. STREBLOW, Basalt Rock Co., Inc., Napa, Calif. The session also will include a panel discussion on methods of getting greater production from existing plant facilities. RALPH REINER, Cleveland Builders Supply Co., Cleveland, Ohio, will discuss "More Efficient Operation of Equipment"; N. C. CASTRONOVA, Rockland Concrete Sales Co., Ridgefield, N. J., will cover "Better Utilization of Labor," and A. E. LLOYD, Alabama Cement Tile Co., Birmingham, Ala., and WM. OLIVER, Louisiana Concrete Products, Inc., Baton Rouge, La., will talk on "Minimizing Shut-Down Time."

On February 3, MORRIS GROSS, Concrete Curing Corp., Detroit, Mich., will present views on "Practical Instrumentation in Block Plant Operation," and GLENN C. BARNES, Barnes & Cone, Syracuse, N. Y., will discuss "Selling Concrete Masonry with Amateur Motion Pictures." "How We Capitalized on a Concrete Masonry Demonstration House" will be discussed by A. HARRY WAGNER, Plasticrete Corp., Hamden, Conn., and PHILIP BUEHNER, Buehner Cinder Block Co., Salt Lake City, Utah, will cover "Radiant Floor Heating with Concrete Masonry Floors." A paper also will be presented on "Applying the Principles of Modern Lighting to Concrete Block Plants."

In addition to the regular sessions, plans are being made to present divisional meetings on various aggregates including Waylite, Haydite, Celocrete, cinder, Superock, and pumice. These will be held in a series of two each on the first three afternoons.

Exhibitors and their location at the 1949 Concrete Industries Exposition are listed below along with equipment to be exhibited:

J. W. Appley & Sons, St. Petersburg, Fla., complete line of concrete block plant equipment, Booths 147 to 150.

Art Stone, Inc., architectural-faced concrete masonry unit, Booth 51.

Bergen Machine Tool Co., Nutley, N. J., block machine parts, Booth 156.

Besser Manufacturing Co., Alpena, Mich., complete line of concrete block plant equipment, Booths 97 to 100, 111 to 114.

Blaw-Knox Co., Pittsburgh, Penn., bins and batching equipment for concrete block and ready-mixed concrete plants, truck mixers, Booths 135-136.

Butler Bin Co., Waukesha, Wis., bins and batching equipment for concrete block and ready-mixed concrete plants, Booth 78.

Cedar Rapids Block Co., Cedar Rapids, Iowa, Durowall reinforcing for masonry walls, Booth 90.

The Celotex Corp., Chicago, Ill., lightweight aggregate, Booth 50.

Chain Belt Co., Milwaukee, Wis., truck mixers, Booths 102 to 105.

Chicago Pneumatic Tool Co., New York, N. Y., Booth 91.

Cleveland Vibrator Co., Cleveland, Ohio, vibrators for block machines, bins, etc. Booth 157.

Clinton Machine Co., Clinton, Mich., gasoline engines, Booth 119.

Clipper Manufacturing Co., Kansas City, Mo., concrete masonry saws, Booths 106-107.

Coast Metals, Inc., Canton, Ohio, hard-facing welding products, Booth 154.

Commercial Shearing & Stamping Co., Youngstown, Ohio, cored pallets for concrete block machines, Booths 81-82.

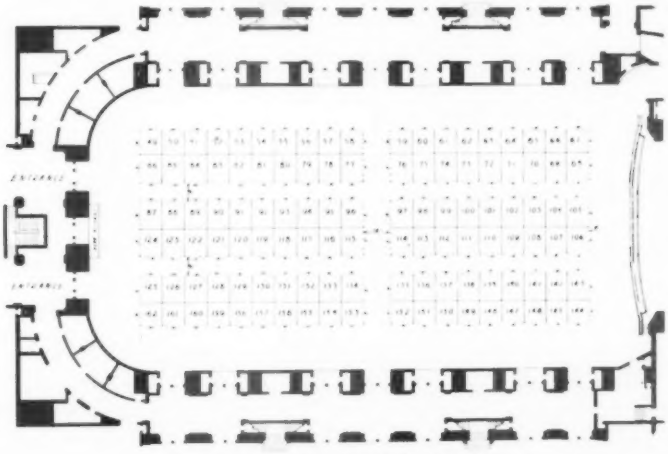
Concrete, Chicago, Ill., Booth 54.

Concrete Machinery Co., Hickory, N. C., Booth 63.

Concrete Manufacturer, Chicago, Ill., Booth 73.

Concrete Products, Chicago, Ill., Booth 110.

Daybrook Hydraulic Corp., Bowling



Floor plan for 1949 Concrete Industries Exposition

Green, Ohio, dump bodies for delivery of ready-mixed concrete, Booths 84-85.

Dodson Manufacturing Co., Wichita, Kan., batch mixers for concrete block plants, Booth 125.

Domine Automatic Machinery Corp., Rochester, N. Y., concrete block machine accessories, Booth 155.

Dow Chemical Co., Midland, Mich., magnesium pallets for block machines, Booth 101.

Erickson Special Equipment Manufacturing Co., Minneapolis, Minn., lift trucks, Booth 59.

Erie Steel Construction Co., Erie, Penn., bins and batching equipment for concrete block and ready-mixed concrete plants, Booth 138.

Flam Concrete Industries, Van Nuys, Calif., line of concrete products manufacturing equipment, Booths 137-138.

Fleming Manufacturing Co. and **Concrete Transport Mixer Co.**, St. Louis, Mo., complete line of concrete block plant and ready-mixed concrete plant equipment, Booths 87 to 89, 122 to 124.

F. C. George Machine Co., Orlando, Fla., complete line of concrete block plant equipment, Booths 75-76.

Heltzel Steel Form & Iron Co., Warren, Ohio, bins and batching equipment for concrete block and ready-mixed concrete plants, Booth 118.

Hercules Steel Products Co., Galion, Ohio, dump bodies for delivery of ready-mixed concrete, Booths 108-109.

Jackson & Church Co., Saginaw, Mich., complete line of concrete block plant equipment, Booths 79-80.

Jaeger Machine Co., Columbus, Ohio, truck mixers, Booths 130 to 133.

C. S. Johnson Co., Champaign, Ill., bins and batching equipment for concrete block and ready-mixed concrete plants, Booths 92-93.

Kent Machine Co., Cuyahoga Falls, Ohio, complete line of concrete block plant equipment, Booths 49-86.

Lith-I-Bar Co., Holland, Mich., complete line of concrete block plant equipment, Booths 94 to 96, 115 to 117.

Master Builders Co., Cleveland, Ohio, concrete admixtures, paints, waterproofings, etc., Booths 120-121.

Master Chrome Service, Inc., Cleveland, Ohio, hard surfacing for mold boxes, Booth 53.

Maxon Construction Co., Dayton, Ohio, dump bodies for delivery of ready-mixed concrete, Booths 161-162.

Medusa Portland Cement Co., Cleveland, Ohio, portland cements, concrete paints and waterproofings, Booth 126.

Merchants Chemical Co., Chicago, Ill., protective coating for concrete block racks, Booth 74.

Mortarless Tile Machine Co., Los Angeles, Calif., concrete block machine, Booth 128.

Multiplex Concrete Machinery Co., Elmore, Ohio, complete line of concrete block plant equipment, Booths 60 to 62.

Oswalt Engineering Service Corp., Forest Park, Ill., concrete block machine accessories, Booth 129.

The Gene Olsen Corp., Adrian, Mich., complete line of concrete block plant equipment, Booths 55 to 58.

Albert F. Schaefer, Rochester, N. Y., concrete block estimating tables, Booth 157.

Service Caster, Albion, Mich., attachment for lift truck forks, Booth 70.

Solvay Sales Division, Allied Chemical & Dye Corp., New York, N. Y., calcium chloride, Booth 153.

Stearns Manufacturing Co., Adrian, Mich., complete line of concrete block plant equipment, Booths 66 to 69.

Symons Clamp Manufacturing Co., Chicago, Ill., concrete wall forms and reinforcing accessories, Booth 152.

Tamms Silica Co., Chicago, Ill., concrete colors, paints, special aggregates, water-proofings, etc. Booth 151.

Towmotor Co., Cleveland, Ohio, lift trucks, Booths 139-140.

Truck-Man, Inc., Jackson, Mich., lift trucks, Booth 127.

Universal Door Carrier, Inc., Indianapolis, Ind., curing kiln door and door carriers for concrete block plants, Booth 134.

White Motor Co., Cleveland, Ohio, trucks, Booths 141 to 146.

Yale & Towne Manufacturing Co., Philadelphia, Penn., lift trucks, Booth 77.

Equipment to be Displayed

BRIEF DESCRIPTIONS and photographs of a few of the outstanding pieces of equipment and exhibits to be displayed at the 1949 Concrete Industries Exposition are given herewith.

Multi-Plex Concrete Machinery Co., Elmore, Ohio, will feature a core pallet block machine with an air-operated tamper. Vibration and tamping are combined to produce a pressed finish top. In addition, the company will show for the first time the Multi Plain Pallet machine which has been redesigned from the Multico machine.

The Kent Machine Co. will display a new Stediflo mixer and a Lintelator block machine.

Blaw-Knox Co., Pittsburgh, Penn., will display colored transparencies of the company line of construction equipment, and have on hand a working scale model of the new HiBoy trukmixer.

Besser Manufacturing Co., Alpena, Mich., along with its regular line of equipment, will display late information on Aglite, equipment being manufactured by the company to produce

(Continued on page 144)

Heltzel stationary batching plant for transit mix concrete has three aggregate compartments and one compartment sealed for cement

Cable Address: Macpipe

Successors to McCracken Machinery Co.

CONCRETE PIPE MACHINERY CO.

PACKER-HEAD CONCRETE PIPE MACHINES

EXPORT OFFICE
121 BROAD STREET, NEW YORK 4, N. Y.

← Reply to: →

— Main Office —
Sioux City 19, Iowa, U. S. A.

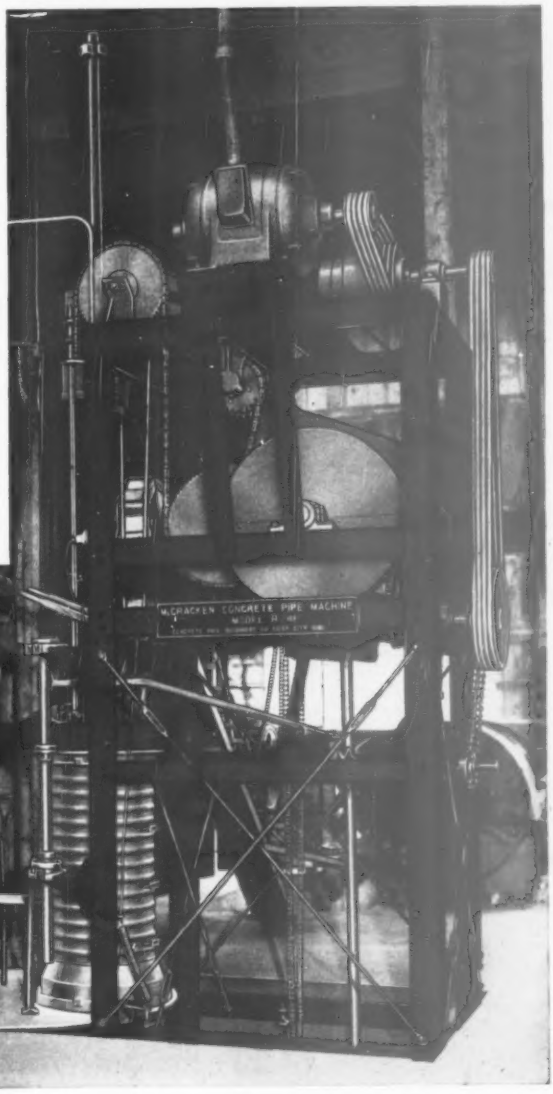
Corrugated
TRADE MARK

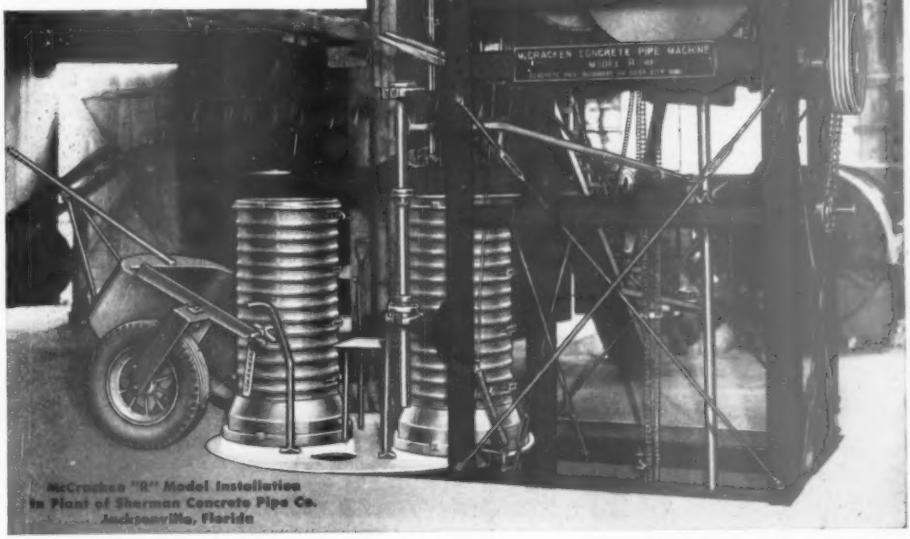
Model "R" Sewer-Pipe Machine

Range of Sizes — 4" to 18"

Designed

For the Manufacturer Already
Equipped to Make Large Sizes
With Tamp Machines
With Hand-Cast Molds
or by Centrifugal Process.





McCracken "R" Model Installation
in Plant of Sherman Concrete Pipe Co.
Jacksonville, Florida

Also Make Model "T" Sizes 4" to 36" Roll-Up Machine

•

Model "D" Makes Butt-End DRAINTILE in 1 ft. and 2 ft. lengths Sizes 4" to 16"

•

Write for full details and prices on either Model "R" or Model "T" "McCracken" Machines

Only the Packer-Head Process Makes 4" to 18" Pay Real Profits, Because:

1. It makes two pipe per minute.
2. 2,400 Feet Per Day.
3. "Strips" on Spigot-End. No Pallets.
4. Saves Buying 800 Pallets in Each Size.
5. Saves Extra Handling of Entire Output.
6. Saves Handling and Greasing Hundreds of Pallets Each Day.
7. Permits Double Shifts in Rush Periods Without Extra Equipment.
8. Extra Products and New Markets.
   - A — Drain Tile.
   - B — Underground Conduit for Electric Wires.
   - C — Prestcrete Units for Pre-Stressed Concrete Floor and Roof Slabs.

a lightweight aggregate from clay, shale, and fly ash.

F. C. George Machine Co., Orlando, Fla., will feature a medium, direct-action hydraulically operated "two block" machine with a capacity of 480 block per hr. Movies of actual operation of the machine will be presented.

Symons Clamp & Manufacturing Co., Chicago, Ill., will construct its booth with concrete forms manufactured by the company. Sheating will show Plyform, Harborite, Kimpreg and Ponderosa Pine. Magnesium alloy panel forms will be displayed for the first time.

C. S. Johnson Co., Champaign, Ill., will feature its batching equipment and bins through enlarged photographs.

Kwik-Mix Co., Port Washington, Wis., will display the new Moto-Bug, a power wheel-barrow designed for construction use. The unit features forward and reverse power, instantaneous gravity dump, and has a hopper body capacity of 1200 lb.

Bergen Machine & Tool Co., Inc., Nutley, N. J., will have available for inspection, a plain pallet cleaning machine. Pallets fed into the machine, pass through chipping discs at the rate of 5 per minute and are picked up at the opposite end cleaned.

The Celotex Corp., Chicago, Ill., will have on display, block from different plants using Celocrete aggregates showing the different textures in the 4- x 8-in. size as well as the bull nose block. Samples of the aggregates will be shown.

New six-wheel White Super Power truck with greater horsepower than any previous model

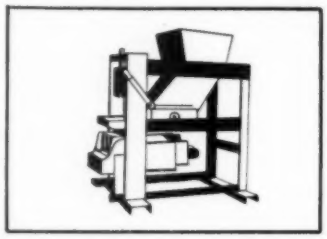
The Master Builders Co., Cleveland 3, Ohio, will feature visual displays including: demonstrations on waterproofing, densifying and coloring concrete products; and charts showing results obtained in the manufacture of concrete products using Pozzolith.

Chain Belt Co., Milwaukee, Wis., will have as its principal feature, a 3-cu. yd. Rex Hi-Discharge Moto-Mixer with a separate engine drive. The unit will be mounted on a KD-10 International truck. Color movies will show the machine, and other Chain Belt equipment, in action.

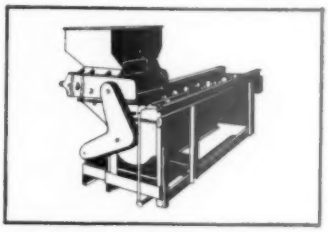
Maxon Construction Co., Inc., Dumpcrete Division, Dayton, Ohio, will present a 20-min. color movie showing Dumpcrete bodies in action on construction jobs. Scale working models of the units mounted on truck chassis, will supplement the film.

Commercial Shearing & Stamping Co., Youngstown, Ohio, will display its line of close-clearance cored-steel

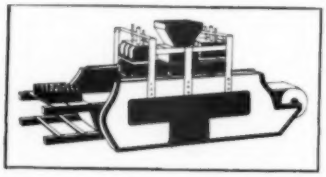
(Continued on page 146)



Gocorp Junior produces one standard unit per operation

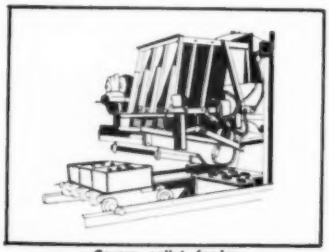


Cocorp Senior block machine produces twelve 8-in. units per min.



Gocorp King block machine has capacity of 24-30 block per min.

Erickson lift truck utilizes boom in charging a concrete pipe. Truck has 11-ft. fork lift, 17-ft. hook lift, and capacity of 6000 lb. and 3500 lb., respectively



Cocorp pallet feeder

Clipper masonry saw, which permits instantaneous adjustment of cutting head, has ball bearing conveyor cart and snap-on blade guard cover

Barber-Greene *Sensational*

NEW CAR UNLOADING TEAM!

unloads car of rock or crushed stone in 45 minutes

B-G HOPPER CAR UNLOADER

Here's a rugged all-material unloader that's completely new in design. The 358 cuts hopper car unloading time as much as 90%—unloads most any bulk product from fine sandy material to large-sized rock aggregates at capacities up to 3 tons per minute—empties a 60-ton car in as little as 45 minutes without jam-ups or delays. There's *positive material flow at all times*. Easily "spotted" in track pit or above rails—really portable—can be towed at normal traffic speeds.

B-G PORTABLE CONVEYOR

The newly designed B-G Model 363 Portable Conveyor is an extremely flexible machine that will prove to be profitable to yards, industrial plants, contractors, etc. Speeds up stockpiling or transfer of material from car or stock pile to trucks. Entirely new in design, the 363 features V belt drives, pneumatic tires, shock absorbers, towing hitch, and a host of new improvements. Send for new attractive literature on these two great B-G machines.

BARBER · GREENE COMPANY · AURORA, ILLINOIS

Constant flow Equipment

LOADERS · PERMANENT CONVEYORS · PORTABLE CONVEYORS · COAL MACHINES · BITUMINOUS PLANTS · FINISHERS · DITCHERS

***It works instantly*—this** spur to profits by checking costs: the Clark Method of handling materials. By speeding material flow, it automatically expands capacity. By tiering material it transforms idle air rights into profitable storage space. It reduces demurrage, cuts the accident rate to a minimum. You'll *find* many uses, for every use is an opportunity to save money. A good way to start is to CONSULT CLARK.

Material Handling News is "Must" reading —send for it.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 60, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

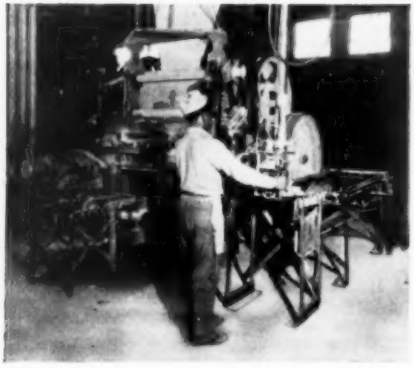
DOMINE AUTOMATIC PALLET FEEDER*

Why have a man handle 50 tons of steel daily when a ¼ H. P. motor will do the same work better?

Modernize Your Present Block Machine

Easily attached to any 18"x26" pallet magazine fed block machine. Makes it truly one man operated.

1. You cut your operating labor on each machine by one-half.
2. You cut your lift truck operations by one-half by eliminating moving of empty racks in plant.
3. You can cube your cured blocks in front of block machine.
4. You double the life of your pallet feeder chain as only a few pallets are carried in magazine.



*Patent Applied For

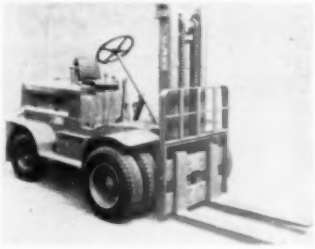
DOMINE AUTOMATIC MACHINERY CORP.
155 GOULD STREET
ROCHESTER 10, N. Y.

Concrete Exposition

(Continued from page 144)

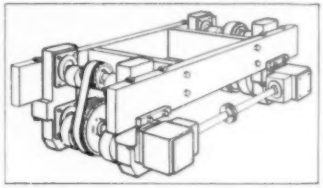
pallets, including pallets for modular size and bull-nose corner concrete units.

Concrete Transport Mixer Co., St. Louis, Mo., will exhibit the new Hi-Lo truck mixer and standard mixer, both featuring visible mixing action.



Clark Yardlift—60 equipped with 112-ft. lift, 42-in. standard forks, side-shifter, pneumatic tires and condensing muffler

Cleveland Vibrator Co., Cleveland, Ohio, will display all types of vibrators, valves and fittings manufactured by the company. In the line of pneumatic vibrators, there are over 60 types and sizes available for use on block machines, pipe forms, etc.



Oswalt synchronized dual vibrator with special vibrating attachment

Fleming Manufacturing Co., Inc., will display along with its regular line of equipment the new FMC 24 plant mixer, a 2-sack mixer with 3-sack drum capacity and gear reduction. Increase from 2-sack to 3-sack capacity has been accomplished by replacing a 15-hp. motor with a 25-hp. motor.

A.C.P. 'News Letter'

AMERICAN CONCRETE PIPE ASSOCIATION, Chicago, Ill., beginning this year, will publish a "Monthly News Letter" on the first of each month for members of the Association. The letter is to take the place of informal weekly letters which had been sent to members previously. The "Monthly News Letter" will contain information on Association activities, short factual notes about technical and promotional developments in the industry, and notes of interest about industry members.

JACK LESUEUR AND ART J. MARTIN have announced plans to construct a ready-mixed concrete plant in Olathe, Kan. Daily capacity will be 125-cu. yds. of concrete.

American Concrete Institute Annual Convention

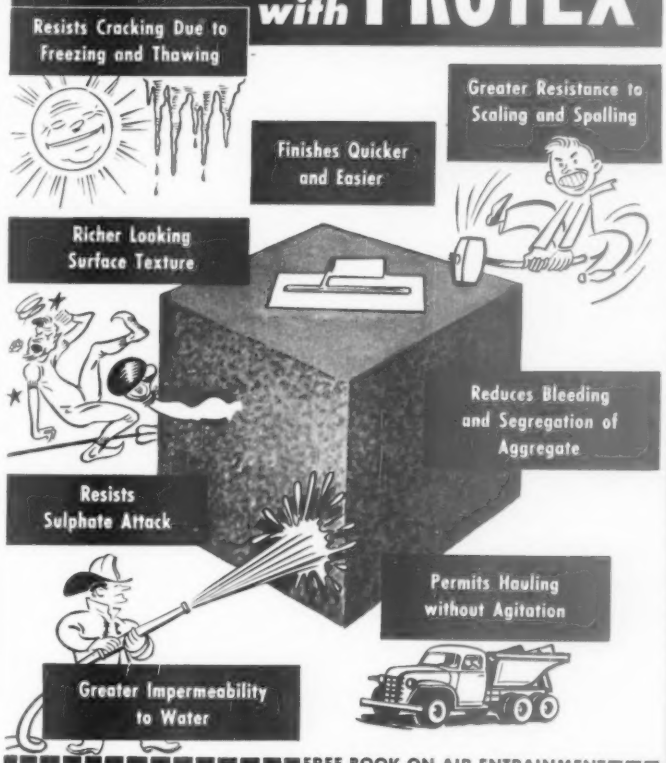
NEW YORK CITY will be host to the American Concrete Institute February 23-25 for its 45th annual convention to be held at the Hotel Statler (Pennsylvania). Tentative plans for the program, which will consist of six sections, have been announced. General registration and technical committee meetings are scheduled for the first day plus one general session to take place in the afternoon. This will be divided into two parts. B. D. TALLAMY, superintendent of New York State Department of Public Works, and CHARLES M. NOBLE, chief engineer, New Jersey State Highway Department, will discuss regional concrete paving problems of construction and maintenance during the first half of the meeting, and J. F. BARBEE, Ohio State Highway Department, will present a paper summarizing all important literature on the subject of air entrainment in concrete. ROBERT F. BLANKS and W. A. CORDON, Bureau of Reclamation, will digest a paper entitled "Practices, Experiences, and Tests with Air-Entraining Agents in Making Durable Concrete."

The second general session, to be held on the morning of February 24, will be concerned with notable structural problems in the advancement of reinforced concrete. C. P. SIESS and NATHAN M. NEWMARK will make a digest of their paper "Rational Analysis and Design of Two-Way Concrete Slabs." FRANK E. RICHART will make a brief presentation from his paper "Reinforced Concrete Wall and Column Footings," and ROBERT E. GLOVER, Bureau of Reclamation, Denver, Colo., will present a paper covering use of various laboratory aids in the design of concrete structures.

Presentation of awards by President Blanks will take place at the Institute luncheon on February 24. The same afternoon, there will be a short session covering report of tellers on the annual election, induction of new officers and the address of the retiring president. Two papers will be presented under the general heading "Problems in the Production and Use of Ready Mixed Concrete."

On the morning of February 24, PROF. S. J. CHAMBERLIN, chairman, and PROF. GEORGE W. WASHA, secretary, will preside over the annual session of Committee 115—Research. The final session will feature two papers on "Cast-in-Place Architectural Concrete"—one on the design elements to be presented by JOHN J. HOGAN, and the other on construction features and details to be presented by E. B. OBERLY. A. J. BOASE is co-author of each paper. RALPH W. KLUGE, formerly National Bureau of Standards, will present results of studies on lightweight aggregate concrete. Plans are to present a paper concerning developments and progress in the manufacture of masonry units.

Get ALL the Advantages of Air-entraining with PROTEX


Resists Cracking Due to Freezing and Thawing
Greater Resistance to Scaling and Spalling
Finishes Quicker and Easier
Richer Looking Surface Texture
Reduces Bleeding and Segregation of Aggregate
Resists Sulphate Attack
Permits Hauling without Agitation
Greater Impermeability to Water

FREE BOOK ON AIR ENTRAINMENT

FOR LOWER FINISHED COST PER YARD OF CONCRETE . . . USE PROTEX AEA

AUTOLENE LUBRICANTS CO.
Industrial & Research Division, Denver 9, Colorado
Please send me your book, "Facts on Modern Placement of Concrete Through Air Entrainment."
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Speed Production—Decrease Injuries

Designed by specialists for safety, these thumb-type hand pads offer maximum protection and cool comfort at minimum cost. Heavy genuine horse-hide. Workers like them.

Sample pair — $1.00 — Dozen pairs — $11.40

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2749 W. Huntington St., Phila. 32, Pa.

Gloves • Respirators • Goggles • Shields • Aprons • Helmets

PRECISION VIBRATION WITH THE TOPDOG FORM VIBRATOR

Let us help you solve your problem in vibration. Write us for specific information as to your particular problem.

TOP DOG form vibrators available for 110 or 220 volt 3-phase, 60 cycle A.C.

FREE BOOKLET

Write for technical booklet giving information of profitable interest to everyone associated with concrete construction.

VIBRO-PLUS CORPORATION
243 West 55th St., N.Y.C.
Telephone: Plaza 7-0648

A FEW CHOICE TERRITORIES OPEN FOR DISTRIBUTORS

NEW MACHINERY

Concrete Vibrator

STOW MANUFACTURING CO., Binghampton, N. Y., announces the J4 concrete vibrator featuring the newly-designed Model 250 vibrator head.

Concrete vibrator engineered for rugged service

This improved model is said to have double the operating life of its predecessors. Oil lubrication is made possible by a lubricant retaining seal.

Lightweight Truck

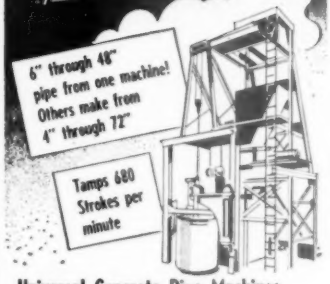
ELWELL-PARKER ELECTRIC CO., Cleveland, Ohio, has developed a relatively small, light-weight, electric power industrial truck for fast maneuvering and tiering loads that are not excessively heavy. Weighing 4550 lb. including battery, the unit is said to manipulate loads up to 2000 lb. safely. Length overall with 30-in. fork is 96 in.; width is 32½ in. This size, together with straight-line steering mechanism enables the unit to turn in 60-in. intersecting aisles and in 109-in. right-angle aisles. Straight travel speed with full load is 5¼ m.p.h. Maximum height of lift of fork is 121½ in.

Correction

IN the New Machinery section of CONCRETE PRODUCTS, November, 1948, we erroneously stated that the Gerlinger Carrier Co., Dallas, Ore., is *now* in production of a lift truck that is a companion to the company's material carrier. The Gerlinger Carrier Co. has manufactured this line of lift trucks since 1935.

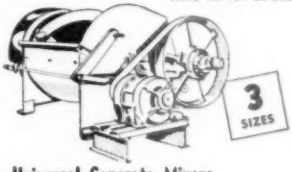
Universal

Pipe-Making Machines are real profit makers because they're built by pipe-makers! ... They produce more pipe in fewer man-hours ... at greater profit!



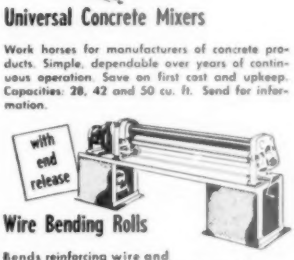
Universal Concrete Pipe Machines

Real money-makers because they make finest ASTM Specification pipe at lowest cost of operation and maintenance. Designed and built by experts with a quarter century pipe making experience. Write for full details.



Universal Concrete Mixers

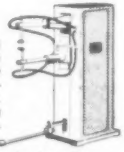
Work horses for manufacturers of concrete products. Simple, dependable over years of continuous operation. Save on first cost and upkeep. Capacities: 28, 42 and 50 cu. ft. Send for information.



Wire Bending Rolls

Bends reinforcing wire and steel plate to any radius, accurately, quickly. Quick, easy removal of completed cages. Extra heavy frame and oversize bearings, with covered gears and overload safety feature.

Wire Mesh Welder



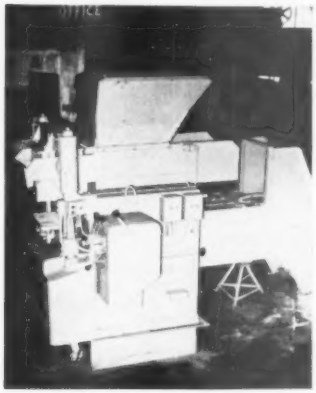
Specially designed for welding reinforcing wire (but adapts for many other uses). Best there is for steady heavy-duty service. Fully enclosed in steel. Water-cooled electrodes. Heat control switch. Swivel foot pedal leaves both hands free.

"It's better to own Universal Equipment... ...than to compete against it!"

Write Today for details, prices
UNIVERSAL CONCRETE MACHINERY CO.
297 South High Street — Columbus, Ohio

Improved Block Machine

COLUMBIA MACHINE WORKS, Vancouver, Wash., is in production on its No. 3, a plain pallet, hydraulically operated block machine. The top lever



Hydraulically operated block machine capable of 300 block per hr. with one operator

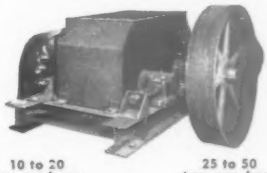
on the machine operates the feeder ram valve, the center lever operates the compression cylinder valve, and the bottom lever operates the ejection cylinder valve. Push buttons operate the pump motor and the vibrators. It operates at one cycle per 12 seconds and can turn out 300 4- x 8- x 12-in. block per hour with one operator or higher capacities with two men.

One motor runs a 20 g.p.m. Racine pump and another the eccentric vibrator shaft. The concrete is then compressed under a load of eight tons. Plain pallets are stacked at rear of the machine and hydraulically fed. Loaded pallets are ejected onto an off-bearing set of rolls. The machine is of rugged construction and occupies a relatively small floor space with low head room requirements.

Package Conveyor

GEORGE HAISS MANUFACTURING CO., INC., New York City, announces a newly designed package conveyor, model 485, for handling bags, boxes, bundles, cases, cartons, etc. weighing up to 500 lb. at the rate of 30 per min. The new model is available in standard lengths, 15- to 50-ft., and standard widths, 14-, 18-, 24- and 30-in. Various types of the conveyor now being produced include the portable elevating type with pneumatic wheels, elevating type with steel wheels, elevating type with caster mounting and elevating type with feed and discharge sections. Other features are a rubber pulley lagging of ¼-in tire tread rubber, easily replaceable without removing the pulley from the conveyor, and a telescoping feed end with toggle bolt take-up, adjusted at one point only.

CINDER CRUSHERS FOR BLOCK MAKERS



10 to 20 ton per hour capacity $474

25 to 50 ton per hour capacity $1074

7 Day Delivery

TRUCK SCALES

Built in capacities from 10 to 40 tons and with platform sizes to 50 feet. Only Bonded has the patented one-piece, self-aligning rocker bearing in the weighing beam, assuring greater accuracy and continuous service. Used by foreign and U. S. governments and the U. S. armed forces.

BONDED SCALE & MACHINE CO.
1101 Bellview Ave. Columbus 7, Ohio
Phone: Garfield 2186, University 2832, Evenings

Immediate Delivery

Manufacturers of Scales, Crushers, Conveyors, and Vibrating Screens.

ACROW FLOOR CENTERS

for Constructing Firesafe Floors with Besser Vibrapac Soffit Tile Units

Acrow Adjustable Steel Floor Centers provide temporary formwork for fire resisting floor construction jobs using Besser Vibrapac Soffit Tile. Adjustable to various floor spans. Easily installed by unskilled workmen. Replace obsolete, wasteful method of cutting and nailing timber for shoring. Efficient. Economical.

Top view of an Acrow adjustable Steel Floor Center, 7" wide.

Workman laying floor tile on Acrow Floor Centers.

Acrow Floor Centers make possible ceiling and floor surfaces of acoustical and insulation value that can be left exposed or painted. Ideal for radiant heating on floor or attached to ceiling and plastered.

Acrow extensible bolting fork and extensible Cam Turning Key. Note beautiful exposed ceiling upper left corner after center in foreground has been lowered.

N.C.M.A. Bulletin 21 and Supplement 1 assist the architect and structural engineer in the design of concrete filler block floors and roofs.

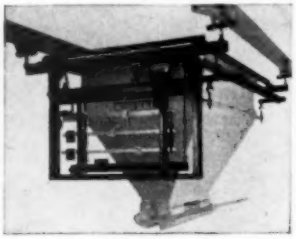
See Sample Display — N.C.M.A. CONVENTION Cleveland, January 31 to February 3.

BESSER MANUFACTURING CO.
ALPENA, MICHIGAN, U. S. A.

A 5483-1½HC-R2

WEIGH BATCHERS

From 1000 lbs. to 50,000 lbs. capacity



- STATIONARY OR TRAVELING TYPE
- MANUALLY OPERATED OR FULLY AUTOMATIC
- DIAL OR ANY NUMBER OF BEAMS
- SINGLE OR MULTIPLE COMPARTMENTS
- CLAM SHELL, SLIDE OR ROLLER GATES

SEND FOR BULLETIN NO. 211

MEYER SCALES, INC.
449 Central Ave.
Orange, New Jersey

See These New Money-Makers
at the
CONCRETE INDUSTRIES EXPOSITION
Cleveland Jan. 31 - Feb. 1, 2, 3

Booth 63
Ornamental Tables

Curved Love Seats

We have a full line of Concrete Specialty Molds
Write for literature
CONCRETE MACHINERY CO.
Hickory North Carolina
P.O. Box 2248

Concrete Industries

(Continued from page 137)

introduction of radiant heat floors in commercial buildings, dwellings, and animal shelters, in which vermiculite concrete sub-slabs reduce heat loss to the ground. We are also seeing an increasing awareness on the part of consumers of the comfort to be obtained by insulating against noise, both in public buildings and homes, which opens a large market for vermiculite acoustical plaster. In addition, constant research by the vermiculite industry is developing new and important uses for our products in other fields."

A pumice producer commented: "I do not think that there will be any decline in the building industry during the year 1949. As for my own business, I have given a very careful study to the commitments we have made for the coming year and, adding to this a very small percent out of the group that have inquired about the use of pumice aggregate, but have not made any definite commitments, I honestly feel that our production in 1949 will double our 1948 volume."

A producer of burned shale aggregates said: "I doubt if the election will materially affect the back-log of construction during the next year or two. Home building and Institutional public buildings are not likely to be adversely affected even though industrial construction might be."

Drain Tile Tests

(Continued from page 140)

20 percent of the aggregate used should be a good washed buck-shot or pea rock, all depending, of course, on the percentage of coarse and fines in the sands being used.

Concrete drain tile manufacturers have taken great strides in the manufacturing of their product, and farmers using drain tile many times prefer the concrete rather than other types. In addition, the United States Department of Soil Conservation is assisting the farmers in planning their draining work and also checking to see that the work is done properly. There is no cost to the farmers for this and the farmers are very cooperative in having this work done.

A few suggestions on visual inspection of drain tile are given as follows: The size of drain tile shall be designated by their interior diameters. Drain tile smaller than 12-in. in diameter shall have a minimum length of 12-in. Tile of from 12- to 30-in. in diameter, inclusive, shall have lengths not less than the diameters. Tile larger than 30-in. in diameter shall have a minimum length of 30-in. Drain tile shall be substantially uniform in structure throughout, and the inspector shall investigate this property by examining fractured surfaces. Drain tile shall give a clear ring when stood on end and dry tapped with a light hammer.

For Uniform, Controlled Concrete

Install [SC]² PRECISION CONCRETE CONTROL **It Includes**

Moisture Meter

Makes a test for moisture content of fine or coarse aggregates in ONE minute. Accurate to ¼%.

Compensator

Delivers correct DRY weight of wet aggregates and ADDED water without calculations or charts. Makes a graph record of EVERY BATCH.

[SC] CONTROL *produces uniform concrete. Is always approved by concrete engineers. Has definite sales value. Write for full information.*

Scientific Concrete Service Corp.
724 Salem Avenue, Elizabeth 3, N. J.

"ANCHOR"
Complete
EQUIPMENT AND ENGINEERING SERVICE

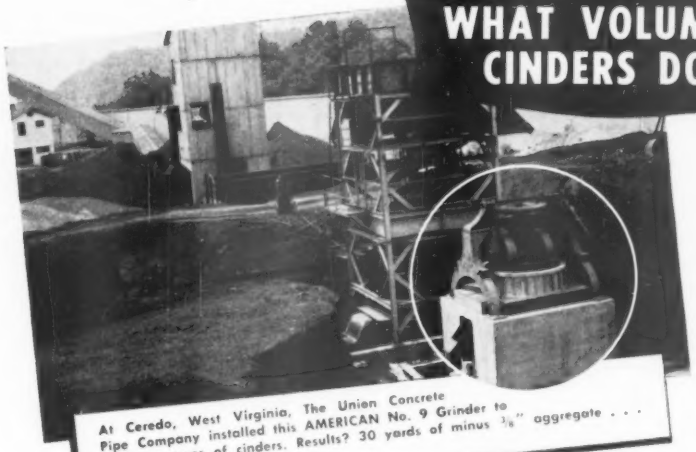
Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Stearns Clipper Stripper Machines; Stearns Joltcrete Machines; Stearns Mixers; Cast Iron and Press Steel pallets. Straublex Oscillating Attachments, etc.

Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

Anchor Concrete Mchy. Co.
1191 Fairview Ave., Columbus 12, Ohio

WHAT VOLUME OF GROUND CINDERS DO YOU NEED?



At Ceredo, West Virginia, The Union Concrete Pipe Company installed this AMERICAN No. 9 Grinder to work on acres of cinders. Results? 30 yards of minus 3/8" aggregate . . . every hour, every day.

Select from 8 AMERICAN Grinders Hourly Output 4 Yards to 75 Yards!

Write your own ticket for your plant's cinder-grinding requirements . . . one of the 8 AMERICAN Grinders will give you the output needed . . . deliver minus 3/8" mesh aggregate without additional separation! Your AMERICAN Grinder will require minimum maintenance . . . will conserve power . . . will help produce low-cost, top-quality cinder block. Write . . . wire . . . phone . . . ask for an AMERICAN grinding expert to help you lick your problem.

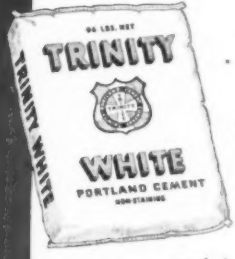
CAPACITIES . . . YDS. PER HOUR

No. 5	4	No. 9	30
No. 6	6	No. 482	35
No. 7	12	No. 418	50
No. 8	20	No. 384	75

American GRINDERS by
W. A. RIDDELL CORP.
BUCYRUS, OHIO

TRINITY WHITE

PORTLAND CEMENT



A whiter white cement that gives greater beauty wherever used. It is a true portland cement.

Trinity Division, General Portland Cement Co.,
111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 West Fifth St., Los Angeles.

as white as snow

. . . for white or colored stucco . . .

cast stone . . . terrazzo . . . paints

. . . concrete architectural units . . .

and for many light reflective uses

FOR CONSISTENT PROFITS . . . **Standardize on KENT**

Coordinated Machinery —

1. KENT Vibra-TAMP BLOCK MAKER
2. KENT STRIPPER
3. KENT Continuous MIXER
4. KENT Stedifio MIXER
5. KENT Concrete ELEVATOR
6. KENT LINTELator
7. KENT Batch MIXERS
8. Complete KENT Packaged BLOCK PLANTS
9. KENT TAMPER

The KENT MACHINE Co.

CONCRETE PRODUCTS MACHINERY • Cuyahoga Falls, Ohio

It's New . . . it's Different . . . it's Sensational!

BARTILE

WORLD'S FINEST CONCRETE ROOFING TILE

Permanent as concrete, because it *is* concrete . . . yet extremely light weight, due to its exclusive manufacturing process . . . new, colorful, low-cost, interlocking BARTILE adds distinctive new beauty . . . enhances the value of the building it covers. Fire-proof qualities mean reduced insurance rates — increased rental, loan and resale values.

- AVAILABLE IN ANY COLOR DESIRED
- MODERN . . . STORM-PROOF . . . LOW COST . . . NO UPKEEP . . . LIGHTWEIGHT . . . DEPENDABLE
- FIRE-PROOF . . . UNAFFECTED BY HEAT, COLD, RAIN OR SNOW . . . SUN-PROOF . . . WATERPROOF
- CANNOT RUST, ROT OR DECAY . . . ACTUALLY IMPROVES WITH AGE . . . PERMANENT . . . SAFE

For Maximum Profits with Minimum Investment

***Manufacture* BARTILE**

EASY TO MAKE. With a little practice a common laborer can make from 6 to 8 squares of dependable, low-cost, waterproof Bartile (900-1200 tile) daily!

EASY TO SELL. Its distinctive, modern shape and wide range of beautiful colors make permanent, customer-pleasing Bartile a roof that sells on sight!

EASY TO APPLY. Up to 10 squares of light-weight, self-aligning, interlocking Bartile can be easily laid by one laborer in one day!

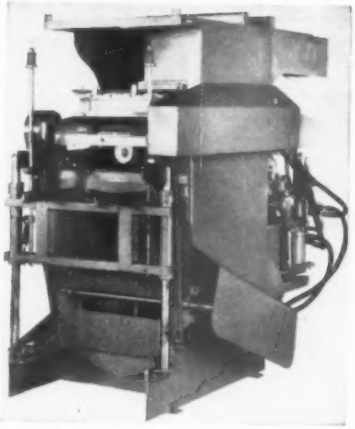
For full details on the terrific profit possibilities of Bartile — world's finest concrete roofing tile — write today to

E. P. BARBER CO.
900 W. Valley Blvd., Bloomington, Calif.

E. P. BARBER COMPANY, BLOOMINGTON, CALIFORNIA

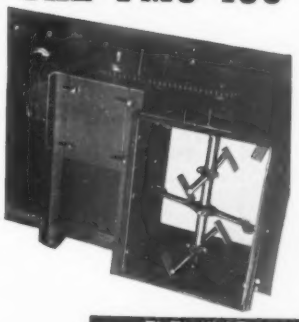
FLEMING OF ST. LOUIS

THE QUALITY NAME IN CONCRETE PRODUCTS PLANT EQUIPMENT



- **The FMC 180 is the leader of a rugged line of FMC equipment for the production of top quality concrete block. Engineered throughout for fast full-time production and long wear.**
- **Three standard 8 by 8 by 16 inch blocks per minute produced by one man operation.**

THE FMC 180



- **One cent per block charge-off will pay for the FMC 180 in six months.**
- **FMC 180's are now in successful operation in 20 states and 20 foreign countries. The list of satisfied users is growing daily. Thorough compaction and maximum density obtained with superior vibration assisted by quick-acting Agitator in the Filling Hopper. The Agitator, as shown, is powered separately by its own ½ horsepower geared-head motor. It provides an ample and continuous flow to the Mold Box while maintaining a head pressure above the Mold Box.**

COMPLETE BLOCK PLANTS ENGINEERED TO YOUR REQUIREMENTS

THE PLAIN PALLET VIBRATOR AT LOW COST!

FLEMING MANUFACTURING CO. INC.
COMPLETE CONCRETE BLOCK PLANT EQUIPMENT

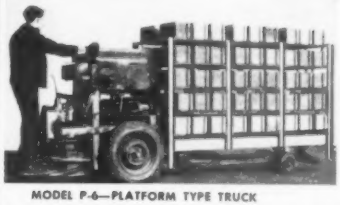
4987 FYLER AVE. - - - ST. LOUIS 9, MO.

Erickson POWER LIFT TRUCKS

MODEL F-5—SPECIAL HIGH LIFT WITH SCOOP

MODEL F-16
"SUPER-SPECIAL" HIGH LIFT FORK TRUCK

MODEL F-5—SPECIAL HIGH LIFT FORK TRUCK



MODEL P-6—PLATFORM TYPE TRUCK

UPPER LEFT—Model F-5 Erickson Fork Truck, with quick detachable scoop for general yard work. Fehr Concrete Pipe Works, Eau Claire, Wis.

CENTER—Model F-16 Erickson Fork Truck for extra heavy loads, shown with an 84" concrete pipe section. N.D. Concrete Products Co., Bismarck, N.D.

UPPER RIGHT—Model F-5 Erickson Fork Truck, building stockpile 3 cubes high. Increases output, saves time, lowers yard handling costs, eliminates chipping or breakage. Little Rock Lumber & Coal Co., Alma, Mich.

LEFT—Model P-6 Erickson Power Lift Truck, handling rack of 90 blocks 8x8x16 over ordinary unpaved runways. The Connecticut Valley Block Co., West Springfield, Mass.

Each Erickson Power Lift Truck is individually designed for the work it is to do. Write for literature, tell us your needs.

See us at Booth 59
N.C.M.A. Convention
Cleveland Auditorium
Jan. 31 — Feb. 1-2-3

ERICKSON SPECIAL EQUIPMENT MFG. CO. 1405 Marshall St. N. E., Minneapolis 13, Minnesota

LOOK into UNIT!

Lift the FULL VISION CAB from any UNIT crane or shovel —

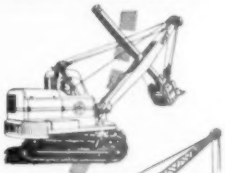
And You'll find...

- Power without bulk... fast and easy on the swing.
- One-piece cast gear case completely encloses all gears and shafts.
- Heavy-duty, interchangeable disc type clutches.
- Heat-treated alloy steel gears and shafts . . . involute splined.
- Gas or Diesel engines . . . mounted in straight line with main machinery.
- Longer tracks . . . wider shoes . . . perfectly counterbalanced for tough lifts.
- Fewer parts . . . less maintenance cost.

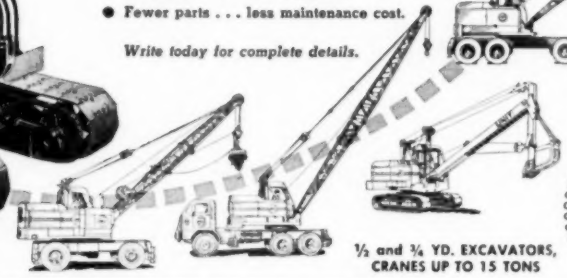
Write today for complete details.

Many UNIT features were built around ideas and suggestions of operators themselves — men who know what they want!

You can tell it's a UNIT by the FULL VISION CAB. There's no other cab like it.



Convertible to ALL ATTACHMENTS
Shovel
Clamshell
Dragline
Trenchoe
Magnet

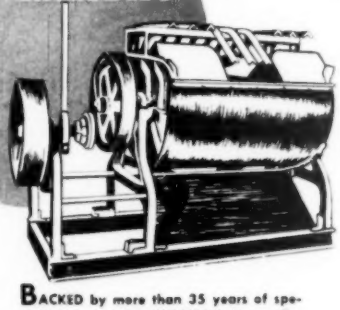


½ and ¾ YD. EXCAVATORS, CRANES UP TO 15 TONS

UNIT

UNIT CRANE AND SHOVEL CORP., 6431 W. Burnham St., Milwaukee 14, Wis., U. S. A.

BLYSTONE MIXERS



BACKED by more than 35 years of specialized experience, BLYSTONE Mixers offer five basic advantages for a wide variety of concrete work: 1—*Low Initial Cost;* 2—*Low Mix Cost;* 3—*Thorough Mix;* 4—*Easy Operation;* and 5—*Sturdy Construction.*

Write for complete details.

BLYSTONE DIVISION
STANDARD SAND AND MACHINE CO.
549 W. Washington Boulevard • Chicago 6, Illinois

JOIN 11,900 PRODUCERS WHO REGULARLY READ ROCK PRODUCTS

CLASSIFIED ADVERTISING

READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT

Single insertion rate $10.00 a column inch. Larger insertions at lower rates; request Concrete Products Classified rate card. POSITIONS WANTED and POSITIONS VACANT (not display ads) $1.00 a column inch an insertion. Terms: Cash with order except contract advertisers who are billed monthly.

FOR SALE

SPACE HEATERS
WAR SURPLUS BARGAIN

NEW
Ready To Use!

40,000 BTU capacity

Burning gasoline, kerosene or diesel fuel. Electric blower — 12 V. DC or 110 V. AC using small transformer.

Portable, Quick, Clean Heat

Ideal for curing room, concrete plants, work under construction, emergency heat, or auxiliary heaters.

weight — 44 lbs.

$95.00 each

In Original Crates, Packed for Export

CLAPP, RILEY and HALL CO.
14 No. Clinton St. Chicago 7, Illinois

FOR SALE

1 Stearns yard stacker; capacity 3—8"x8"x16" (or equivalent) blocks at one operation. This machine has only been used one week. Will sell for 25% less than cost. In perfect condition.

Elizabethton Cinder Block, Inc.
S. Sycamore St. Phone 864
Elizabethton, Tenn.

FOR SALE

Erickson 2-Ton Fork Lift, spare reconditioned engine, two spare hard rubber wheels, $1,500.00 complete.

LAYRITE CONCRETE PRODUCTS
1225 East Trent Ave.—Spokane 15, Wash.

FOR SALE

2,000—13x18½ plain steel pallets for Besser Victory Vibrapac Block machine.

FRED RADANDT SONS
2382 S. 18th St. Manitowoc, Wis.

FOR SALE

One Model T-40 BRIKCRETE MACHINE with 1500—¾" treated plywood pallets. This machine has made less than 8,000 brikcrete. The reason for selling is that we cannot operate it along with our block plant. Will sell for one-half its initial value.

RAABE GRAIN COMPANY
Continental, Ohio

FOR SALE

One Besser K3 Block Machine complete with attachments for 3", 4", 8" and 12" block, including Back-up units, half height block, etc. 52 steel racks, 2025 Steel Pallets, mixer and skip hoist.....$3,000.00

This machine has been recently overhauled and can be seen in operation daily at our plant.

Our reason for selling is that we are installing a larger machine.

CAMP CONCRETE PRODUCTS CO.
Andrews Road — Columbus, Ga.
Phone 2-8823 — P.O. Box 748

1—Dunbrik Production Mach. 8000 to 10,000 beautiful brick per day complete with 3000 pallets, trays and lift jack. Will sell with or without mixer.

1—Dunn Champion Drain Tile Mach. complete with forms and ready for operation. 240 Tile per hour.

1—Jagger 2 bag cement mixer. Not over 100 hrs. use.

1—Fuel Oil heated tar kettle on wheels. Excellent shape.

MASONRY PRODUCTS CO.
End of So. Chauncey St.
Columbia City, Ind.

---

1 1946 Studebaker, 2 speed w/3 yd. Daybrook Dump Body. Good Condition.

2 G.M.C. Trucks 1947 Model, Mounted with 4½ yd. Rex Transit Concrete Mixers, with Separate Drive Chrysler Industrial Motors and 200 gal. Water Tanks. Good Condition.

1 Trailer, New in 1947, 1 Ton, 2 Wheel, Rubber Tired. Good Condition.

1 Compressor, Air, Jaeger, Model 315 Diesel, Mounted on Rubber Tires. Less than 100 hrs. Serial No. C-3315. Good Condition.

1 Concrete Mixer, Portable No. 10 Dandle Trail Mixer Mounted on Steel Wheels. Serial No. 12926. New in 1946. Good Condition.

1 Light Plant, Portable—7.5 KVA, Powered with Wisconsin Air Cooled Motor. Good Condition.

1 Concrete Bucket ½ yd. Good Condition.

1 Clamshell Bucket, ½ yd. Halss with Teeth. Good Condition.

1 Clamshell Bucket, ¾ yd. Owen. Good Condition.

1 Dragline Bucket, NEW 2 yd. Esco (Light Weight) Complete with Corner Wearing Shoes and Extra Teeth. Good Condition.

1 Hoist, Double Drum, M & M, with Waukesha Gas driven Engine, Completely Reconditioned.

1 Hoist, Double Drum, Sasgen, New in 1947, with LeRoi Motor. Good Condition.

1 Pumpcrete Rex 160 Double with Pugmill Remixer, with 1000' Pipe, Completely Reconditioned.

1 Heater, Nelson Portable No. G.T. 5052 with 6" Duct Tube. New in 1947. Good Condition.

1 Crane, P&H Model 255A (New in 1947) Complete with 60' Boom and 5' Jib and Shovel Front. Gas Driven, Crawler Type. Good Condition.

1 Truck Crane, Insley ½ yd. 60' Boom Mounted on Heiderman Truck. Good Condition.

1 Tractor (New), Allis Chalmers H.D. 19 with Baker Dozer and Hyster Double Drum Power Unit.

1 Tractor, Clark Airborne, with Dozer. Good Condition. New in 1946.

1 Tower, Steel, H.D. 150' 3 Wheelbarrow, with safety device, Concrete Hopper and Elevator Platform. Good Condition.

1 Saw, Masonry, Electric. Good Condition.

2 Pumps, Jaeger 3" Serial No. 831067 and 831083. Completely Reconditioned.

1 Pump, Jaeger 4". Mod. 4P with Continental F 140 Motor. Ser. No. F 14011828. Completely Reconditioned.

1 Pump, Barnes, 6" Gas Motor. Serial No. 225541. Completely Reconditioned.

1 Pump, Barnes, 4", Mod. 40M. Completely Reconditioned.

1 Pump, Rex 4", Serial No. 1094. Completely Reconditioned.

1 Pump, Rex. 6" (New in 1947). Completely Reconditioned.

1 Pump, Jaeger 3". Completely Reconditioned.

2 Winch, Hand, Sasgen No. 110. Good Condition.

2 Vibrators, Mall, 3 H.P. Mounted on Steel Revolving Base with 20' Shafts. Serial No. 311108 and 311118. Completely Reconditioned.

2 Jacks Simplex, H.D. 15 ton. Mod. 24-A and 29. Practically New.

2 Mats, Blasting 10x10. Practically New.

1 Batching Plant, 3 yd. Complete with Blaw Knox Aggregate Bins, Scales, and 2—450 bbl. Cement Storage Bins with Elevator and screw type Conveyors. Good Condition.

1 Scales, Concrete, Winslow, Jr. Practically New.

1 Unloader, Cement Bulk, Screw Type. Complete with 2 Electric Motors. Good condition.

Price and location will be furnished upon request. This equipment is subject to prior sale or disposal.

C. F. RULE CONSTRUCTION COMPANY
217 Thirteenth Ave., No.
P.O. Box 517, Nashville 3, Tenn., Phone 6-5384

FOR SALE

Two Flam Vibrator Concrete Block Machines complete with molds for 13 sizes of blocks.

HARRISON PUMICE TILE CO.
P.O. Box 591 Sanger, Calif.

ALSO SEE CLASSIFIED ADVERTISING ON OTHER EQUIPMENT IN ROCK PRODUCTS' GENERAL SECTION

IT PAYS TO BUY FROM A DEALER WHO STANDS BACK OF EVERYTHING HE SELLS

GUARANTEED USED MACHINERY

Stop Taking Chances And Being Fooled.
Buy From A Dealer Who Guarantees.
CHASE is Reliable and Responsible.
15 Linwood Avenue — Buffalo 2, N. Y.

BUY FROM A DEALER WHO MAKES IT A POLICY OF BEING MOST TRUTHFUL AND HONEST

FOR SALE

Besser Semi-Automatic K3 Tamper
20' Mixer and Skip Hoist
Attachments for 8" Plain, 8" Rock Face, 8" Siding Block, 4" Cored and Solid and 12" Block
1900 Steel Pallets 13"x18"
45 Steel Racks—48 block
$4,500.00

This equipment operating daily to be replaced in January with Besser Super Vibrapac.

VAN POPPELEN BROS.
First and Sherman Sts., Bay City, Mich.
Phone 7503

FOR SALE

1—No. 7, Stearns Jolterete Block Machine, complete with the following attachments:
1—4" Mold Box—4 blocks
1—6" Mold Box—2 blocks
1—8" Mold Box—2 blocks
1—Automatic Offbearer
1—21 Cubic ft. Ideal Mixer complete with motor and control switch. Also extra liners and blades.

Machinery can be seen in operation at our plant and will be available on or about March 1st, 1949. Reason for selling; we are installing a larger machine. Units will not be sold separately. Price $4,000.00.

SLATONS CONCRETE PRODUCTS
Kansas City, Mo.
Call Jackson 3365—John R. Slaton

FOR SALE

2—complete Flam No. 1 and No. 3 Block Machines.
1—Tamper Concrete Pipe Machine and equipment.
Crushing and screening plant.
6' deep well.
Going business or equipment only.
10 acres to work on.
Located in Arizona in an agricultural district.
Only $35,000.00 for complete plant.

Write Box H-13, c/o Concrete Products, 309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE

Quinn Heavy Duty Hand Poured Concrete Pipe Forms: 4—12"; 2—15"; 2—18"; 2—24"; 1—30"; T & G, 2—12"; 1—24" Standard Duty B & S. type.
All in 4 foot lengths. $1,200.00 F.O.B., Baton Rouge, La.

BOWERS CONCRETE PRODUCTS CO.
2142 North 4th St. Baton Rouge, La.

FOR SALE

Besser K-3 Tamper Block Machine with attachments 3⅝, 5⅜, 7⅝, 9⅝, 11⅝.
Complete set of 8" Bullnose and fractional attachments. 30—48 Block racks. 1600 steel pallets $2,750.00

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43 Quinn Heavy Duty Pipe Forms 18" through 48".
Principally 24"—30" & 36" Forms both T&G & B&S.
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120 ton Heltzel batching bins.
Three, 1945 G.M.C. 2½ ton trucks with Rex Mixers.
One, 1947 Ford truck with Jaeger Mixer.
One, 1945 2 ton Dodge truck with Rex Mixer.
One, Huber maintainer with all attachments.
One, Willys Jeep pickup with extension bed and trailer.
One, Smith Air Compressor with hammers.
Complete shop including electric and acetylene welder and air compressor.
Warehouse, Office and all fixtures.

Everything in good condition.
Will sell complete set up or each piece separately

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4. Miles No. 1 combination face down concrete block machine and approximately 300 wood pallets. New condition, price $285.00

All prices F.O.B. Charleston, Illinois

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Good Condition

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All guaranteed to be in first class condition.
Thousands of steel and cast-iron, cored pallets.

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Split Core Division plates and sash attachments
1 3 H.P. Gear Head Motor 3 phase

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35% off List Price

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Block and drain tile plant.
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Will produce over 500—6" tile per hr., 450 average.Will make 5" to 14"
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TEAR OFF HERE

- .....Admixtures, Aggregate
- .....Aftercoolers, Air
- .....Aggregates (special)
- .....Air Compressors
- .....Air Separators
- .....Asphalt Mixing Plants
- .....Bagging Machines
- .....Bags
- .....Barges
- .....Batchers
- .....Belting, Conveyor, Elevator, Power Transmission
- .....Belting, V-Type
- .....Belt Repair Equipment
- .....Bin Level Indicators
- .....Bins and Batching Equipment
- .....Blasting Supplies
- .....Block Machines Concrete Building
- .....Bodies, Trailer
- .....Brick Machines and Molds
- .....Buckets
- .....Bulldozers
- .....Cars, Industrial
- .....Classifiers
- .....Clutches
- .....Coal Pulverizing Equipment
- .....Concentrating Tables
- .....Concrete Mixers
- .....Concrete Mixing Plants
- .....Concrete Specialty Molds
- .....Concrete Waterproofing and Dampproofing
- .....Conveyors
- .....Coolers
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- .....Dewatering Equipment, Sand
- .....Diesel Engines
- .....Dragline Cableway Excavators
- .....Draglines
- .....Dredge Pumps
- .....Drilling Accessories
- .....Drills
- .....Dryers
- .....Dust Collecting Equipment & Supplies
- .....Electric Motors
- .....Engineering Service, Consulting and Designing
- .....Explosives & Dynamite
- .....Fans and Blowers
- .....Flotation Equipment
- .....Gasoline Engines
- .....Gear Reducers
- .....Generator Sets
- .....Grinding Media
- .....Gypsum Plant Machinery
- .....Hard Surfacing Materials
- .....Hoists
- .....Hoppers
- .....Kilns: Rotary, Shaft, Vertical
- .....Locomotive
- .....Lubricants
- .....Mills
- .....Pulverizers
- .....Pumps
- .....Scales
- .....Screen Cloth
- .....Screens
- .....Scrubbers: Crushed Stone, Gravel
- .....Shovels, Power
- .....Speed Reducers
- .....Tanks, Storage
- .....Tractors
- .....Trucks, Industrial
- .....Trucks, Mixer Body
- .....Trucks, Motor
- .....Vibrators
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- .....Winches
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Your Name..... **Title**.....

Firm Name .....

Street .....

City ..... **State**.....

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CLEVELAND PUBLIC AUDITORIUM
JANUARY 31, FEBRUARY 1-2-3, 1949

THE BIENNIAL DISPLAY OF EQUIPMENT AND MATERIALS USED IN THE PRODUCTION, HANDLING, DISTRIBUTION AND USE OF CONCRETE PRODUCTS

PRESENTED BY THE

NATIONAL CONCRETE MASONRY ASSOCIATION

IN CONJUNCTION WITH ITS 29TH ANNUAL CONVENTION AS A SERVICE TO THE THOUSANDS OF CONCRETE PRODUCTS MANUFACTURERS THROUGHOUT THE UNITED STATES

NCMA

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See the machines, materials and methods that will make news and profits for you in 1949. See the biggest array of cost-saving, profit-making equipment and materials for the concrete products industry ever placed under one roof. Meet with experts in production, in research, in merchandising. Here in intimate, open-forum convention sessions you can talk over fundamental problems with men in your kind of business from all over the country. After four profitable days at the 1949 Convention and Exposition, you will go home with the solution to many of your problems and with many new, practical ideas that will improve your production and profits. You'll say your time was never better spent.

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POWER TOOLS
IMPORTANT

A Full Half Bagger
TRADE MARK
ECLIPSE
TILTING DRUM CONCRETE MIXER
An improved 3½ cu ft. mixer at a low price. Handles all classes of work done by the average contractor: Foundations, sidewalks, curbs, gutters, floors, retaining walls, blocks and silos.
Quick uniform mixing — easy to load — positive geared discharge — visible mixing action — handles coarse or fine aggregate — plenty of power enclosed in dustproof housing — 5.50 x 15 pneumatic tire makes easy moving.
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MANUFACTURED BY
GEO. C. CHRISTOPHER & SON IRON WORKS
FOR FORTY YEARS THE WORLD'S BEST IN CONCRETE MACHINES
P. O. BOX 610 WICHITA, KANSAS

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GOCORP DRAIN TILE MACHINE

(Lee Patents)

A concrete drain tile machine which makes better tile—faster. New, yet proven—more than 20 now in use.

Check These Advantages:

- **Up to 12 tile per minute (2 men) in sizes to 14".**
- **Loads of power. Quickly adjustable, hydraulic packer head lift.**
- **Easily installed. Low maintenance cost. Low first cost.**

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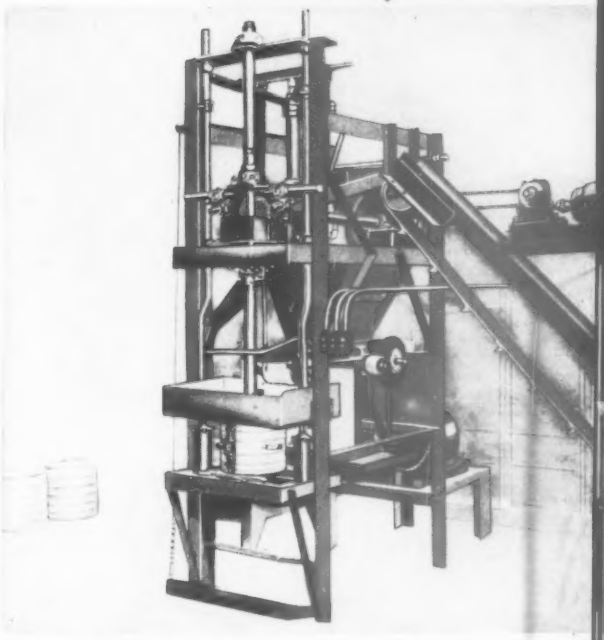
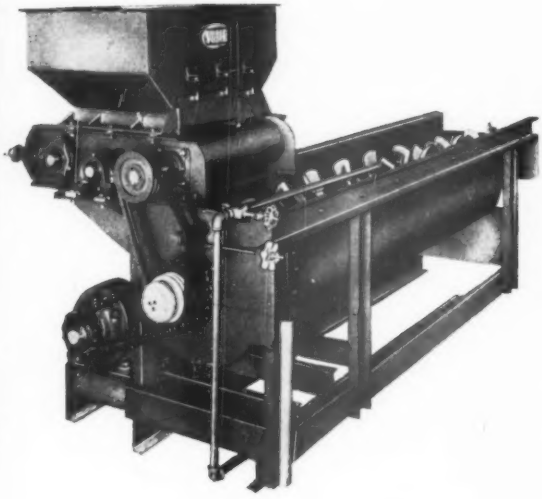
Block Machines • Batch Mixers • Skip Loaders • Labor Saving Devices • Improved Parts and Attachments for Stearns Machines.





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Here is a new continuous mixer, which for the first time corrects proportioning errors due to bulking from varying moisture content. A remarkable advancement.

The First Continuous Mixer to Give You All These Features:

- **Continuous Flow Densifier—assures uniform proportioning of cement and aggregates.**
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- **Variable Speed Mixing Control—produces to fit capacity of machine being fed; up to 20 cu. yds. per hour.**
- **Compact—double mixing action plus more blades makes possible the use of a short, 8 foot barrel.**

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TOP ONE-MAN PRODUCTION!

with the Stearns 15

AUTOMATIC PLAIN PALLET CONCRETE BLOCK MACHINE

"Modern as the Buildings of TOMORROW"

The giant Stearns 15 was designed and built to the specifications of up-to-date, forward-looking, dollar-wise, metropolitan concrete block plants and others which needed and now have achieved *highest production of perfect blocks in varied sizes, designs and aggregates at lowest cost.*

Adjustable from 12 to 18 blocks per minute (8"x8"x16".) • Entire continuous cycle from filling molds to racking blocks to power cleaning and oiling of empty pallets—pushbutton controlled by one man. • Vibration of both mold box and pressure head for uniform density from top to bottom. • Finger-tip control of production rate and density of units. • Long rugged life with minimum labor, pallet and maintenance costs. • Thoroughly tested and proved in better plants throughout America.

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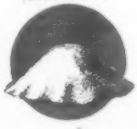


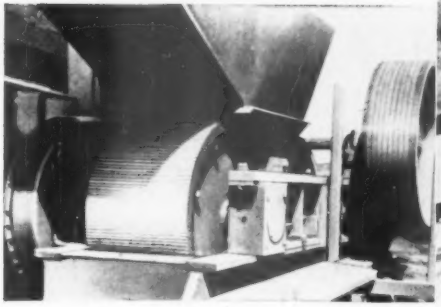
For the New Year — Resolve to try

RESISTO-LOY and MANGATONE N.M.

on that tough crushing job

Save You Money - Crush More Rock
Reduce Maintenance Costs

For Rebuilding All Types
of Rock Crushing Equipment



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Increased Aggregate Tonnage
Decreased Labor Cost Per Ton
Decreased Maintenance
Reduced Repair Downtime

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Central Representative: J. E. Oliphant & Co., 505 Uhler Bldg., Marion, Ohio
South-Central Representative: Barney E. David, 518 E and C Bldg., Denver, Colo.
Mid-Western Representative: Red Arrow Sales Corp., 12 So. Livingston St., Madison 3, Wis.
Western Representative: L. R. Edminster, 2751 S. W. Hume Ct., Portland 1, Ore.

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Flexco HD Rip Plate

Flexco HD Belt Fastener

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4684 Lexington St., Chicago, Ill.

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Sold by supply houses everywhere

For SALE or LEASE

In Bulk or Piecemeal

Quarry, Plant & Equipment

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200 acres high calcium limestone, unlimited depth, with only 4' clay overburden at Calera, Alabama. Plant has two 17'x 60' vertical Kilns with coal bunkers, mounted on massive steel bins. Ample storage bins, hydrating equipment, steel skip bridge, etc. Will sell or lease for operations or piecemeal lots for dismantlement. Trade Names of "Snow White" and "Eureka" are available.

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Niles, Ohio

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Here is the quick way to get information and prices on machinery and equipment. Just check the item (or items) listed below about which you desire information. Then send this page to us, and we will take care of the rest.

TEAR OFF HERE

.....Admixtures, Aggregate
.....Aftercoolers, Air
.....Aggregates (special)
.....Air Compressors
.....Air Separators
.....Asphalt Mixing Plants
.....Bagging Machines
.....Bags
.....Barges
.....Batchers
.....Belting, Conveyor, Elevator, Power Transmission
.....Belting, V-Type
.....Belt Repair Equipment
.....Bin Level Indicators
.....Bins and Batching Equipment
.....Blasting Supplies
.....Block Machines Concrete Building
.....Bodies, Trailer
.....Brick Machines and Molds
.....Buckets
.....Bulldozers
.....Cars, Industrial
.....Classifiers
.....Clutches
.....Coal Pulverizing Equipment
.....Concentrating Tables
.....Concrete Mixers
.....Concrete Mixing Plants
.....Concrete Specialty Molds
.....Concrete Waterproofing and Dampproofing
.....Conveyors
.....Crushers
.....Coolers
.....Cranes
.....Derricks
.....Dewatering Equipment, Sand
.....Diesel Engines
.....Dragline Cableway Excavators
.....Draglines
.....Dredge Pumps
.....Drilling Accessories
.....Drills
.....Dryers
.....Dust Collecting Equipment & Supplies
.....Electric Motors
.....Engineering Service, Consulting and Designing
.....Explosives & Dynamite
.....Fans and Blowers
.....Flotation Equipment
.....Gasoline Engines
.....Gear Reducers
.....Generator Sets
.....Grinding Media
.....Gypsum Plant Machinery
.....Hard Surfacing Materials
.....Hoists
.....Hoppers
.....Kilns: Rotary, Shaft, Vertical
.....Locomotives
.....Lubricants
.....Mills
.....Pulverizers
.....Pumps
.....Scales
.....Screen Cloth
.....Screens
.....Scrubbers: Crushed Stone, Gravel
.....Shovels, Power
.....Speed Reducers
.....Tanks, Storage
.....Tractors
.....Trucks, Industrial
.....Trucks, Mixer Body
.....Trucks, Motor
.....Vibrators
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.....Winches
.....Wire Rope

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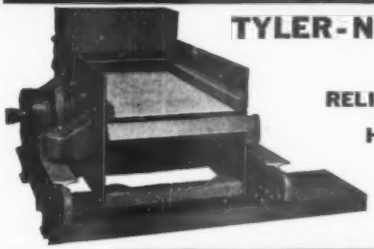

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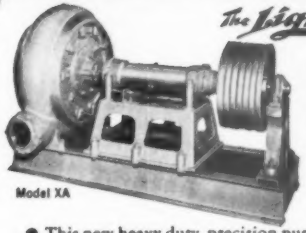

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Complete information; specifications, capacity tables and exploded views of parts . . . send for your copy today.

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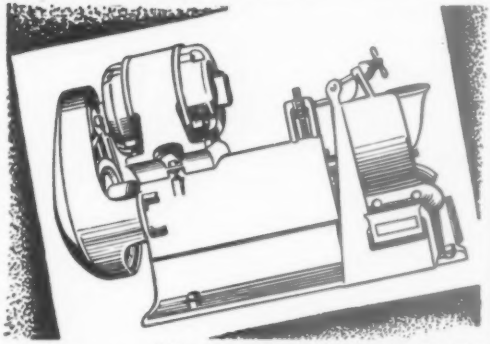
SAND & GRAVEL PUMPS



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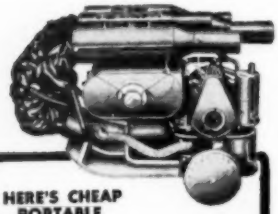

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6—1200 CFM 13.9" SP with motors.
3—1000 CFM ⅝" SP with motors.

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5,000 gals. hor. 6'x23'7"x5/16" (NEW).
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ABSORBER—260,000 gals., 22' dia. 90' high, vert.
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1—HD 7 Tractor W/Dozer
1—D 4 Tractor W/Dozer

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3—Link Belt Model LS 60 Crawler Cranes
3—Bay City Model 20 Crawler Cranes

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5—Insley Model K-12 Crawler Cranes
2—Lorraine Model 40 A Crawler Cranes

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Several thousand Resharpened type "H" Timken drill bits. Assorted sizes.

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One 65 C Byers Shovel ½ c.y. with LeRoi Gasoline Engine
One 75 B Lorain Shovel 1¼ c.y. with 26' boom with UD-18 International Diesel Engine, with dragline attachments
One Koehring Dumptor W-60, with 468 Buda Diesel Engine
Four Koehring Dumptors W-60, with 471 G.M. Diesel Engines
Two UMW-40 Worthington Wagon Drill, with 1¼" chuck, mounted on two pneumatic tired wheels
One 315 c.f. Worthington Blue Brute air Compressor, with UD-18 International Diesel power, with Elect. Starter, on 4 pneumatic tired wheels

CONSTRUCTION EQUIPMENT CO.
P.O. Box 1229
Birmingham 1, Alabama

FOR SALE

1—60 HP Westinghouse 1160 RPM 440 V 3 Ph 60 Cyc Slip Ring Motor with Motor rails. Serial 2562932.
1—Spider for 4 Roll Raymond Mill
1—Plow support and casting for four roll Raymond Mill
4—25 ft sec 4 inch sand suction hose. (New) Stand Pipe thread connection
8—25 ft sec 4 inch Sand suction hose. (Used) Stand Pipe thread connection
1—Schramm 240 Cu Ft Stationery Compressor Serial No. 6095 with 50 HP—890 RPM 440 V 3 Ph 60 Cyc Slip ring motor (Gen'l Elec) complete with drum controller and resistor grids
1—Two stage 315 Cu Ft. Ingersoll-Rand Compressor, Serial 40-T-729 mounted on steel wheel truck frame, with 75 HP 890 3 Ph 440 V 60 Cyc (Gen'l Elec) complete with Drum Controller and Resistor Grids

WHITE PIGMENT CORPORATION
R.D. No. 1—P.O. Box 861—York, Pa.

REBUILT CRUSHERS

1—No. 6 Champion, Jaw, 12"x26" opening.
1—No. 4½ Champion (No. 10 Beaumont) Jaw, 10" x20" opening.
2—No. 4 Champion, Jaw, 9"x15" opening.
2—No. 6 Traylor, Gyratory, with T.Z. head.
1—No. 4½ Traylor, Gyratory.
1—Penna. Single Roll Crusher 18"x24".
1—Double Roll Crusher 16"x24".
1—Jeffrey Swing Hammer Mill, Type A, 24"x18"
1—Jeffrey Swing Hmmer Mill, Type A, 30"x24".
1—18"x36" Farrel—Type "B"—Not Rebuilt.
1—18" LINK-BELT APRON CONVEYOR—9" pitch, 27" centers, like new.

JOHNSON & HOEHLER, Inc.
P.O. Box 102
Lansdowne, Pa.

⅜ yd. Byers Bearcat Jr. crane
1¼ yd. No. West comb. pullshovel-crane
20 ton Vulcan gas locomotive
25 ton Browning loco. crane 50' boom
Owen clamshell buckets, ½, ¾, 1¼ yd.
160# VT boiler 54" x 8' 5" stamped Nat. Bd.
Barber-Greene 82A Bucket Loader
50 HP Clyde electric hoist, single drum
50 ton Baldwin loco. oil fired ST
45 ton Whitcomb diesel electric loco.
20 ton Whitcomb gas loco.
½ yd. shovel attach. for Bucy-Erie 15B
⅝ yd. shovel attach. for Byers 71W
Shovel attach. for 41 Bucy-Erie

J. T. WALSH
Brisbane Bldg. Buffalo 3, N. Y.

CRUSHERS

GYRATORY: 30" Super. McCully; 36" Allis-Chalmers; also Nos. 12, 10, 9, 8, 7½, 6, 5, & 4. JAW TYPE: 24x36, 22x40, 22x50, 30x42, 42x18, and smaller sizes down to 7x9". REDUCTION TY. 2', 3', 4' & Symons Cone; Nos. 19, 25, 27 & 38 Kennedy; 36" Traylor TZ, 1'8" & 2'4" TY; No. 36 Telsmith Gyrasphere; 7 & 10" Newhouse; Stedman 30 & 36" Imp. Type. **ROLLS:** Allis-Chalmers 72x30, 54x24, 54x20, 40x15 & 18x10. Pioneer 18x30. Universal 16x24. New Holland 24x16 & 16x16; McLanahan 30"x60", 18x24 & 18x30 Single Roll. Also others. **HAMMERMILLS:** Williams Nos. 2, 3, 4 & 6; Jay No. 60 & No. 70; Gruendler 2XB & 3XB; Dixie 2024 & 3650. **MILLS:** Hardinge 3'x8", 6'x22", 6'x3', 8'x3' & 8'x4"; Kennedy 4x8, 5x6, 5x11; Marcy 4x5, 6x6; Smidth 16B Tube Mills; Raymond 4 & 5 Roller Mills; Bonnot, Fuller, Sturtevant & others. **CRUSHING PLANTS:** 25x40 Cedar Rapids Portable, Diesel Power. Others portable & stationary. **BINS & BATCHERS:** 70 & 150 yd., 3-compt. Etc. **TRUCKS:** Euclids, FWD, Internationals, Etc. **SHOVELS:** 80-D Northwest 2½ yd. combination 1-Link Belt Speeder K-580, 3 yd., and others. **DRAGLINES:** 6 Yd. Walker, 147' boom. Diesel Lorain Model 40-A Crane-Dragline, Diesel.

MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Elevators, Excavators, Generators, Hoists, Kiln, Draglines, Drag Scrapers, Dredges, Drills, Engines, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Stacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

MARIETTA ALEX T. McLEOD KANSAS

FOR SALE

1 Six inch sand pump. Mounted on 10x20 ft. barge powered by four cylinder Wisconsin engine. (Engine hasn't been used since it was overhauled. Includes:
250 ft. of 6 inch pipe, 7 elbows and angels; 3 short joints; and 17 barrel floats. Barge needs some calking before being used.
Price complete $2,500.00
1—Caterpillar, Size 30
1—7 ft. Hydraulic Dozer.
All in good condition.
Priced to sell $1,000.00

TYLER CEMENT TILE & SILO WORKS
Tyler Minnesota

Consult Albert!

Tubular Piling, Points, Sleeves and Cobi Pile Tips
Power Piping Fabrication
Supplies of Fittings, Valves and Tube Turns
Pipe—Small and Large Diameters, Iron and Steel, Welded, Seamless, Corrugated

Albert Pipe Supply Co., Inc.
Berry & N. 13th St., Brooklyn, N.Y.
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1—Vulcan 8'x125' Rotary Kiln, 5/8" shell.
2—Allis-Chalmers 9'x80' Rotary Kilns, 5/8" shell.
3—6'x35', 5'x40', 3'x45' Rotary Dryers.
15—Chain and Belt Bucket Elevators, steel housing, 25 to 75'.
2—Tyler Hummer 4'x7' Vibrating Screens.
2—Jeffrey 18"x24" Hammer Mills.
20—Belt Conveyors, Flat and Troughing Type, all sizes.

Send for News Flash

BRILL EQUIPMENT COMPANY
2401 Third Ave., New York 51, N. Y.

FOR SALE

1—78x18 HRT BOILER ASME 200-lb. PRESSURE WITH STOKER.

2—135 HP MURPHY DIESEL ENGINES DIRECT CONNECTED TO 85 KW, 3 PH., 60 CY., 240 VOLT GENERATORS.

1—25 TON, OHIO, 8 WHEEL, MODEL G, STEAM LOCOMOTIVE CRANE WITH 40' BOOM AND ADDITIONAL 25' BOOM SECTION.

BREW, WOLTMAN & CO., INC.
50 Church St. New York 7, N. Y.

Marion Type 37—Electric—1¾ yd.; Bu. Er. 37B—Comb. 1¾ yd.; Lima—1201 Dragline—3 Yard. Lima 503 1¼ Shovel and Drag. Others.

Euclids end dump and bottom dump—Tournawagons—Super C tournapulls.

Steam cranes std. ga. Gas or diesel Loco—24, 36, 42 in. ga. Elec. Loco—St. Ga. 20 Ton. Dump Cars 55 Cu. Ft., 180 Cu. Ft., 16 cu. ft. Ore Cars Std. Ga. 50 tons

Rotary Kilns—Rod Mills—16"-36" Gyratory Crushers—30x18, 40x22 Roll Crushers—40G Slugger Hammermill—9x36, 10x24, 10x36, 14x24, 18x36, 20x36, 24x36, 30x42, 40x42, 42x60 Jaw Crushers some portable some with feeders—Cone crushers 3 and 4 Ft.—Screens sgl. and double and triple dk. Feeders 3x10, 30x5—Dorr Classifiers—Cent. pumps—Deep well pumps—Tuggers—Mine hoists—75, 100, 150, 225 H.P.—Motors—Transformers—Conveyors—Portable Gravel Plants—Road rollers—Wagon Drills—Bu. Er. 29T and 42T Blast Hole Drills—Many other items.

STANLEY B. TROYER
Theatre Bldg. Crosby, Minnesota

FOR SALE

Iowa Model 2-A, 2 unit Mobile Crushing and Screening Plant, 2 years old, in excellent condition.

JOHN F. CASEY COMPANY
Box 1888 Pittsburgh 30, Penna.

LOCOMOTIVES — CARS

80 TON WHITCOMB DIESEL ELEC. LOCO.
65 TON G.E. DIESEL ELEC. LOCO.
2—50 TON NEW 1942, 0-6-0, S.T. LOCOS.
60—NEW 9900 GAL. CAP. TANK CARS

R. C. STANHOPE
60 E. 42nd St. N. Y. 17, N. Y.

FOR SALE: Complete Sauerman Cableway outfit for sand and gravel plant, consisting of: 80' structural steel, self-aligning mast, 20' sections, with six 1⅛" guy cables; 1 cu. yd. cableway bucket with 3 wheel carrier; 675' of 1⅛" track cable, with tension blocks and sheaves; 85 HP Waukesha gas engine on double drum Sauerman hoist, 2 speeds on front drum 400' of ⅝" load cable just new. Spare parts. Priced as a unit. Avail. immediately and ready for service.

MUELLER SAND & GRAVEL CO., Hanover, Kan.

FOR SALE

1 Used Marion 1¼ yd. Electric Shovel, Type 450, Serial No. 6235. This shovel recently completely re-wired; now working every day.

COWAN STONE COMPANY
Cowan, Tennessee

for **IMMEDIATE DELIVERY** *of* **RUBBER PRODUCTS**

CONVEYOR BELTING. TRANSMISSION BELTING. ELEVATOR BELTING. FIRE, WATER, AIR, STEAM, SUCTION and WELDING HOSE.

CALL WIRE WRITE **CARLYLE**

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CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

NEW GUARANTEED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom Covers
48"	8	1/8" — 1/16"
42"	5	1/8" — 1/16"
36"	6	1/8" — 1/16"
30"	6	1/8" — 1/16"
30"	5	1/8" — 1/16"
26"	5	1/8" — 1/32"
24"	5	1/8" — 1/32"
24"	4	1/8" — 1/32"
20"	5	1/8" — 1/32"
20"	4	1/8" — 1/32"
18"	4	1/8" — 1/32"
16"	4	1/8" — 1/32"
14"	4	1/16" — 1/32"
12"	4	1/16" — 1/32"

Inquire For Prices — Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

	Width	Ply	Width	Ply	Width	Ply
Inquire For Prices — Mention Size and Lengths.	18"	6	10"	6	6"	5
	16"	6	10"	5	5"	5
	14"	6	8"	6	4"	5
	12"	6	8"	5	4"	4
	12"	5	6"	6	3"	4

ENDLESS "V" BELTS

"A" Width All Sizes —
"B" Width All Sizes —
"C" Width All Sizes —
"D" Width All Sizes —
"E" Width All Sizes —

Sold in Matched Sets.
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SPECIAL OFFER . . . HEAVY DUTY RUBBER HOSE

FIRE HOSE

APPROVED SPECIFICATION HOSE EACH LENGTH WITH COUPLINGS ATTACHED

I.D. Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

AIR HOSE

I.D. Size	Length	per Length	Universal Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 Pair
¾"	25 "	7.50	1.50 Pair
	50 "	15.00	1.50 Pair
1"	25 "	10.00	1.50 Pair
	50 "	20.00	1.50 Pair

LARGER SIZES ALSO AVAILABLE

All Prices—Net — F.O.B. New York

WATER HOSE

I.D. Size	Length	per Length
¾"	25 feet	$4.25
	50 "	8.00
1"	25 "	6.25
	50 "	12.50
1¼"	25 "	7.50
	35 "	10.50
	40 "	12.00
	50 "	15.00
1½"	25 "	10.00
	35 "	14.00
	50 "	20.00

Each Length with Couplings Attached

CARLYLE RUBBER CO., Inc.

62-66 PARK PLACE, NEW YORK 7, N. Y. Phone: BArclay 7-9793

2 Used Penn Rock Type Bodies

Body 14' long plus 2' scow with 6" rise, 85" wide, 38" high, Sandwich floor, 2" oak filler with ¼" top plate. Full roll cab shield, 2 pair 10" steel extension sides, 8 gage, removable.

FREEPORT GAS COAL CO.
Box 1085, Clarksburg, W. Va.
Phone: Lumberport, W. Va. 3371

FOR SALE

1 P&H Shovel. Mod. No. 650 1½ yds. Std. Front-Ser. No. 4426. Good Condition.

EEL RIVER MINING CO., INC.
410-416 Illinois Building
Indianapolis 4, Indiana

SALE or RENT

1—10-ton Huber 3-wheel Gas Roller. Hydraulic Steer.
1—MC-4 Lorain Moto Truck Crane, 1944.
1—205 Koehring Gas Shovel.
1—503 Koehring Diesel Dragline, 1942.
1—82 Lorain Diesel Combination Shovel and Crane, 1942.
1—P&H 855 Shovel, 2 yd. D-17000 Engine, 1946.
1—8 yd. Page Diesel Walking Dragline.
1—50-ton Whitcomb Std. Ga. Diesel Locomotive, New 1941.
1—25-ton G.E. Diesel Electric Locomotive, 1942.
1—35-ton American Diesel operated Locomotive Crane, 1947.

B. M. WEISS COMPANY
Girard Trust Co. Building
Philadelphia 2, Pa.
Rittenhouse 6-2311

FOR SALE

DREDGE: Sand Dredge, electric, portable, all steel, 10", 200 H.P. with cutter head, pipe, pontoons, cable, etc.
COMPRESSOR: Schramm 420 electric, capacity 450 CFM, 75 H.P. motor, V Belt drive.
DRAGLINE: 4 yd. capacity, 110' boom, 2200 volt, A.C.
DRILLS: 1—Bucyrus Erie 29T with 9" bits and tools, gasoline powered. NEW condition.
1—Bucyrus Erie 42T, diesel powered, with 9" bits and tools.
BOILER: 100 H.P., 100 lbs. pressure, complete with oil burner and control equipment. Portable.
BUCKET: Blaw 1 yd. digging bucket. NEW condition.
TURBO GENERATOR: Curtis Steam Turbine driven Generator Unit, 600 KW, 5 stage, 200 lbs. steam pressure, 3600 RPM, with condenser, General Electric Generator, 750 KVA, 2300 volt, 3 phase, 60 cycles, with exciter, piping, valves, etc.
PUMP: Worthington 40 H.P. steam driven Centrifugal Pump, 300 lbs. steam pressure, 3550 RPM, with steam regulator; complete, in new condition.
GOODRICH SUPER LONG LIFE CORD CONVEYOR BELT (NEW):
1—Piece 1014 ft.
1—Piece 1017 ft.
1—Piece 268 ft.
6 ply, 42 oz. duck, 7/32" top cover, 1/16" bottom cover, on original reels. ALL NEW NATURAL RUBBER; with or without mechanical parts.
MOBILE CRANES:
1—Lima Paymaster mounted on 10 wheel, 6 cylinder Mack, all dual drive; new motor in truck; crane arranged with 80' boom and jib, will lift 18 tons.
1—Byers Truck Crane mounted on 4 cylinder AC Mack truck, 4 wheel, dual drive.
CRAWLER CRANES:
1—Northwest model 25, capacity 12 tons, 75' boom, 30" treads, Chrysler motor. Has special boom hoist for steel erecting.
1—Link Belt Speeder Crane model 75 with 50' boom and ¾ yd. shovel equipment, gasoline powered.
1—Osgood 1½ yd. capacity, 50' boom, gasoline powered.
1—Industrial Brownhoist Crawler Crane, built 1942, steam operated, 20 ton capacity, 50' boom, 160 lb. code boiler.
GYRATORY CRUSHERS: 1—30" with manganese concaves, V-belt drive, with or without 125 H.P., 440 volt motor; capacity 250 tons per hour to 3"
ROD MILLS:
1—42" complete with motor and drive.
1—Allis Chalmers 9-K; 1—Telsmith 16-B, all steel 15" opening.
JAW CRUSHER: All sizes 4x6 to 48x60.
REDUCTION CRUSHERS: Traylor type TZ, size 36"; Kennedy model 37 with motor integral; Symons 4 ft. Cone; Telsmith 32-B complete with V-belt pulley; Allis Chalmers type R322 fine reduction crusher.
ROLL CRUSHERS: Jeffrey 18x24 double roll crusher for coal, coke, cinders, etc. New Holland 14"x16"; Allis Chalmers 54x20, NEW condition.
PULVERIZERS: Jeffrey 24x18 Swing Hammer Pulverizer, shop No. 1159.
Hardinge Conical Ball Mill 6'x22", manganese steel lined, Herringbone gears, with motor and V-belt drive.
KILNS, COOLERS, DRYERS:
1—Single shell 34"x20 ft. complete with drive, burner; no motor.
1—5'x50' brick lined Kiln.
1—9'x10'x12'x213' Kiln, ⅞" shell.
2—7'x120' Kilns with all auxiliary equipment.
SULLIVAN HAULERS: 4—25 H.P., 3 drum, 3 phase, 60 cycle, 220/440 volt, NEW condition.
DERRICK HOIST: National 3 drum, 80 H.P., shop No. 4636, with 15 H.P. separate electric swinger, 3 phase, 60 cycle, 220-440 volt.
MINE HOISTS: Single and double drum, 150 H.P., 400 H.P. (located in California), 600 H.P., 800 H.P., 900 H.P., (located Penna.) and 1000 H.P. All complete with motors and control equipment.
LOCOMOTIVE: Plymouth 30 ton, standard gauge, gasoline, air brakes.

A. J. O'NEILL
Lansdowne Theatre Building
LANSDOWNE, PA.
Phila. Phones: Madison 8300-8301

SHOVELS — CRANES — DRAGLINES

Lima 1201 2½ yd. Hi-Lift Shovel. Diesel.
Buc-Erie 54B Hi-Life Shovel, Diesel.
P&H 955 2½ yd. shovel. Diesel.
P&H 855 B 2 yd. shovel. Diesel.
Lorain 82 2 yd. Diesel shovel.
Lorain 80 1½ yd. Hi-Lift Shovel. Diesel.
Buc-Erie 37B 1½ yd. shovel. Diesel.
Marion 362 1½ yd. shovel. Diesel.
Northwest 6 1½ yd. Diesel shovel.
Lima 410 1½ yd. Diesel shovel.
Buc-Erie 120B 5 yd. shovel. Elec.
P&H 1225 2½ yd. shovel. Elec.
Buc-Erie 175B 7 yd. shovel. Elec.
Marion 37 3 yd. shovel. Elec.
Bay City 30 ⅝ yd. elec. tunnel shovel.
Marion 300 steam shovel; 8 yds. Rebuilt.
Marion 480 steam shovel; 2 yds.
Koehring 605 Diesel crane; 1½ yds.

DREDGES

Morris 10" on steel hull. Elec.
Morris 10" on steel hull. Diesel.
Erie 8" Diesel powered with cutter head.
Bucket Type, steam; 1 yd. bucket.

AIR COMPRESSORS

Penna. 1300 cfm Direct Connected; elec.
New Penna. 900 cfm; synchronous motor
1-R 14x12; rebuilt; 528 cfm; elec.
C.P.T.C. portable Diesel; 500 cfm; on pneumatics.
C.P.T.C 900 cfm; V-belt drive; elec.
C.P.T.C. 105 cfm portable on pneumatics, gas.
C.P.T.C. 315 cfm Diesel portable on pneumatics.

TRACTORS

Cat. D4 with Trackson front end loader.
Cat. D4 with T4 Traxcavator, 1 yd. bucket.
Int. TD9 with front end loader and bulldozer.
2 Cat. D8's with cable angledozers, 2U series.
Cat. D4 with side dump for pipe laying.
Int. TD24 with push plate; used 690 hrs.
Cat. D7 D.D.P.C.U. and angledozer.
Cat. D7 with Hydraulic bulldozer.

STEEL BUILDINGS

76'x90'—14-18', new, never erected.
72'x200'x12'.
New 75'x356'; two 10 ton runways.
1—165'x30'x20' dismantled minus roofing-sides.

SMITH TILTING MIXERS

2—54 ft. with 30 HP AC Motors, etc.

TRUCKS

10—1 ton Int. Cargo Trucks, 4x4 with winches.
50 Diamond T, 6x6; 4 yd. dump bodies.
3 KB-11 Int.; 161" wheel base.
5—New 10 ton Mack chassis Diesel.
Mack LFSW 11 yd. dump truck, Diesel.

CRUSHERS — CRUSHER PLANTS

Cedar Rapids, port. crushing plant 150 tph.
Cedar Rapids, port. crushing plant Model AAA.
Austin Western 100 screening and crushing plant.
JAW: Farrell 6x20, 12x24, 26x24, Cedar Rapids 10x36 Roller Bearing, Telsmith 18x32, Universal 15x24, 15x36, Acme 6x20, 14x26, 18x32, 10x42, Acme 10x42, Acme 18x32, Telsmith 18x32, Acme 16x32, Farrell 24x36, Buchanan 30x42, Traylor 42x48, Cedar Rapids 10x36, Farrell 42"x40.
GYRATORY: Traylor 14" TY 1'8", Al-Chal. 6, 8, 15, 30, 42, Kennedy-Van Saun 19½, 25, 39, 498.
CONE: Symons 4' std. coarse bowl. Symons 4' fine bowl.
HAMMERMILLS: Williams No. 4 and No. 6. Penna. 20x33. Williams Shagger No. 40.
ROLL: 24x16, 40x20, 54x36, Buchanan 36x42.
ROD MILLS: Hardinge 5'x12', Marcy 3'x8'.

READY MIX CONCRETE PLANT

Blaw-Knox complete plant, 105 ton 3 compartment aggregate with 200 bbl. bulk cement bin. New 1946.
Johnson 3 compartment 100 tons plant complete with aggregate and cement compartment.
Heltzel 300 bbl. bulk cement bin with weigh batcher.
Johnson 500 cu. yd. hexagonal bin with 3 aggregate and one cement compartment.
Butler 300 ton 3 compt. bin, 1 compt. 400 bbls. cement; 2 compt. aggregate. Complete with weigh batcher and bucket elevator.

LOCOMOTIVES AND DUMP CARS

12 K&J 16 yd. Air Dump Cars, std. ga.
8 Koppel 5 yd. 36" Ga. Dump Cars.
10 Western 4 yd. 36" Ga. Dump Cars.
Whitcomb 30 ton Gas-Elec. Std. ga. Loco.
Plymouth 20 ton gas Loco. Std. ga.
Plymouth 12 ton gas Loco. 36" ga.
Whitcomb 65 ton Diesel-Elec. Std. Ga. Loco.
G.E. 45 ton Diesel-Elec., std. ga.
Davenport 45 ton Diesel-Elec., std. ga.
Vulcan 12 ton gas, std. ga.
2 Porter steam Loco. 12 tons, 36" Ga.
Baldwin 50 ton Steam Std. Ga.
Vulcan 25 ton Steam Loco. Std. Ga.
Plymouth 30 ton std. ga. Gas. Loco.

DERRICKS AND HOISTS

Clyde 52 HP 3 drum and swinger Elec. Hoist.
Lidgerwood dbl. drum Gasoline Elec. Hoist 80 HP.
American 75 ton stiff leg derrick, new never used, equipped with new Diesel power hoist.
American 50 ton stiff leg derrick 90' boom.
American Terry 10 ton steel stiff leg derrick.
Lambert Steel Guy Derrick 20 ton cap.
Morrison 25 ton stiff leg; 165' boom; 3 drum hoist.
Harris 50 ton Guy Derrick 135 ft. Boom.

RICHARD P. WALSH CO.
30 Church St. New York, N. Y.
Cortland 7-0723 Cable: RICHWALSH

For Immediate Sale:
1—45' crane boom
1—65' crane boom
2—1 C.Y. clam shell buckets
One boom and one bucket are as good as new. The other boom and bucket have been used but are in very good condition. Both booms fit an L77 Lorain shovel. The price will be reasonable.

MALAGUTI BROTHERS
Liberty Street, Plymouth, Massachusetts

FOR SALE

20 Tons Belgian flint pebbles
4' x 16' Tube mills (3)
1 American hammer mill with 125 HP direct connected motor
1 70 HP Marine type diesel engine, same as new
1 3-Drum Ledgerwood steam hoist
1 3-Drum Bucyrus steam hoist
All steel dredge boats, scows, tug boats and pug boats
Steel bins, hoppers and tanks
Fuller-Kinyon pumps 5" and 6"
6' x 50' Manitowac Dryer
1 Yd. and 1¼ Yd. clam-shell buckets
4 Wood hoppers lined with steel
Steel elevators
B & W Coal pulverizer
Steel buildings: 20' x 100' x 10', 75' x 350' and 50' x 350'
Two industrial properties in desirable location, water power, railroad and highway, also good labor conditions.

OLLIE E. LAWRENCE
BOX 688
QUINCY, MICHIGAN

CINDER CRUSHERS
VIBRATING SCREENS
SCALES & CONVEYORS
RECIPROCATING FEEDERS

PROMPT SHIPMENT — REDUCED PRICES

Bag and Block Conveyors	$ 600.00
Belt Conveyors	665.00
Portable Bag and Block Filler	625.00
Reciprocating Feeders	$600.00
Cinder Crusher 10 to 20 ton capacity per hr.	474.00
Large Cinder Crusher 25 to 50 ton capacity per hour	1074.00
20 ton Truck Scales	510.00
15 ton Truck Scales	450.00
Batching Scales	345.00

Vibrating screens, 2' to 5' wide, many lengths, 1 to 5 decks. All with screen cloth or plates to customers' specifications. Priced from 395.00

BONDED SCALE & MACHINE COMPANY
128 Bellview Columbus 7, Ohio
Garfield 2186; University 2832, Evenings

¾ yard Speeder shovel and 35' crane boom—Fairleads M.R.Z. Waukesha, Gas power, built 1938. Working every day—$4000.00.
1½ yd. 45 ton O. & S. steam Locomotive Crane in good condition. $2000.-1942—D6 Dozer, Le Tourneau Blade. A-1 shape. $5000.00.
1 Northwest Model 80—2½ yard shovel with 70' crane boom and Fairleads. Twin city oil burning engine, serial No. 4158. A-1 condition. Rebuilt in 1945 completely. Best offer.

Jack Rodeghier
128 Collins St. Joliet, Illinois

FOR SALE

Cedar Rapids—two unit mobile crushing plant for crushing rock and coal, new, used only 200 hours. Immediate delivery.

JAMES C. MILLER STONE COMPANY
Taylor County Bank Bldg.
Campbellsville, Kentucky

ALSO SEE READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT CLASSIFIED ADVERTISING IN CONCRETE PRODUCTS SECTION

PORTABLE HEATERS
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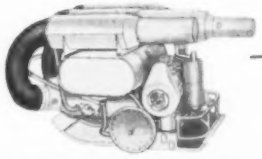

STEWART-WARNER PORTABLE POWERFUL 100,000 BTU GASOLINE-BURNING HEATERS COMPLETE WITH TURBINE TYPE BLOWER AND 1½ HP. AIR-COOLED BALL BEARING ENGINE.

PORTABLE SELF-POWERED MANY PURPOSE HEATER

HEATING buildings, shops, sheds, warehouses, manholes, tunnels, buildings under construction, spot-heating. PREHEATING engines, tractors, trucks, equipment, box cars.
THAWING frozen areas, machinery, pipe lines, tanks. DRYING plaster, paint, mortar, concrete, wet tools.

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Complete with flexible ducts

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Since 1890
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TRACK ACCESSORIES
MIDWEST STEEL CORPORATION
CHARLESTON 21, W. VA.
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FOR SALE
4 x 40 Austin-Western Jaw Crusher. Good Shape.

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HOIST FOR SALE
200 HP single drum 8' dia x 5'6" long complete with automatic electric controls and air operated post brake. Location change makes this excellent unit available.

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Plymouth Meeting, Pa.

FOR SALE
Lorain "40" Dragline with Shovel Front ¾ yd. bucket, completely overhauled, and in excellent condition. Sale necessary to settle estate of Samuel C. Van Horn, Heyworth, Illinois.

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FOR SALE
One Buckeye Diesel Electric Generator Set, 240 RPM, Serial No. 9828, 190 H.P.—156 KVA, 3/60/2300—with Transformer to reduce to 220 Volts. Panel Board, 2 cylinder Horizontal. Can demonstrate. Price $2,500.00.

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Telephone, Alexandria 2021

CRUSHERS
10"x16"-A Farrel Jaw Crusher
10"x20" Climax Jaw Crusher
11"x20" New England Jaw Crusher
18"x30" Double-Roll Crusher Corrugated
28" Hammer type Pigment Pulverizer
Gruendler Hammer Rock Crusher, type 2 XC
Gruendler Aristocrat Peerless Grinder, No. 16-40
Little Giant Hammermill, 3-hp. 4" blower
A-C type R-372 Gyratory Reduction Crusher
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Peg Crushers and Double Rolls
Selected Manganese Jaw Plates

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2'x12' Screw type Gravel Washer
3'x5' 1-deck Hummer Enclosed Screens, (3)
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4'x8' 4-deck Pioneer Vibrating Screens (2)
Screen Cloth for Vibrating Screens

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15"x150' Single-Strand Flight Conveyor
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16"x57' Telsmith Plate Feeder
18"x6¼" Jeffrey Apron Feeder
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24"x250' Trough Belt Conveyor
24"x100' and 150' Trough Belt Conveyors
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42"x50' Trough Belt Conveyor
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Syntron model V-200 Vibrator
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Open Elevators, 6" to 16" Buckets
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800' of No. 825 Elevator Chain with 12" Buckets
New and Used Elevator Buckets, Belt and Sprockets
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60 Selected Sizes of Gear Reducers
Gears and Pinions, Sprockets and Roller Chains
200-amp. Electric Transformer Welder
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20' span Maris Overhead Crane, 10-ton, 3-motor
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2-drum Lidgerwood Electric Hoist, 50-hp. with Swinger
2-drum Air Hoist and 4—1-drum Hoists

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GOOD USED EQUIPMENT FOR SALE
1 Model (L-F) No. 150 1½ Yd. Dumpster-Dempster Bed with 4 buckets $445.00
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Motors and Generators, A.C. and D.C., for sale at Attractive Prices. Large Stock. New and Rebuilt. All fully guaranteed. Send us your inquiries.

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100, 150, 250, 350 HP motors—New and Used 25 Ton Locomotive Crane—Bargain 20" Williams Hammermill—Motor Dr.
37 HP Steam Gen. Boiler—100/250 lbs. pressure
60'x200' NEW Structural Steel Bldg.
15 and 75 Ton O.E.T. Cranes—Motors
1¼—2—2½ Yd. Diesel Draglines

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BELTED: 355, 528, 676, 1000, 1390 and 2570 Ft.
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DIESEL: 603, 807, and 1000 Ft.
PORTABLE GAS: 110, 160, 220, 310 and 540 Ft.

CLAMSHELL BUCKETS and SKIPS and GRAPPLES
7—¾, 1, 2 and 4 Yd. Clamshells
Owen R A & H Stone Grapples
18 Steel Skips 6'x6'x12½
5 Ton Bucyrus Rock Grabs

CRANES—DRAGLINES—SHOVELS
40 Ton American 100 Ft. Boom Whirley Crane
1—1¾ Yd. B.E. 42B Steam Shovel
2—25 and 35 Ton American Loco. Cranes
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17 Yd. Cap. Bucyrus Erie Elec. Shovel
2—10 Yd. Cap. Marion Elec. Shovels
8 Yd. Cap. Marion Elec. Shovel
7 Yd. Cap. Marion Diesel Dragline
6 Yd. Cap. B.E. Monighan Diesel Dragline
5 Yd. Cap. Marion Elec. Shovel
4 Yd. Cap. Marion Diesel Shovel
5 Steam Shovels—3½, 5, 6 and 8 Yd.

DUMP CARS
46—Koppel, 1¼ Yd., 24 and 30 in. Ga., V shaped
15—2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 in. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd., and 30 Yd. Cap.

BOX, FLAT and TANK CARS
9—50 ton Std. ga. heavy duty flat cars
30—8000 gal. cap. tank cars
39—40 ton std. ga. box cars

HOISTING ENGINES
Gas: 15, 20, 60, 100 and 120 HP
Electric: 20, 52, 80, 100 and 150 HP
Steam: 6½x8, 7x10, 8½x10, 10x12, 12x24

DIESEL UNITS
80, 120, 180, and 200 HP F.M. Engines
600 HP Price Rathbun, 300 RPM
200 HP Ingersoll Rand, 600 RPM
200 KW and 30 KW, 3/60/2500 Units
75 KW and 50 KW, 3/60/240 Units
1200 KW—6 Unit F.M. Plant, 3/60/2300

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3'x8", 3'x24", 6'x22" and 6'x48" Hardinge Conical Ball Mills
4'x4' A-C Ball Mill
4x16 and 5½x20 Smidth, 4x18 Bonnot and 5x22 Allis Chalmers Tube Mills
7x18 A-C Dry Compeb Mill
2x6, 3x8, 4x8, and 7x16 Marcy and Hardinge Rod Mills

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2 Roll Raymond High Side with Whizzer
Riley, B & W, Strong Scott and Whiting Coal Pulverizers
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No. 1½ Sturtevant Ring Roll
4 Roll Low Side Raymond

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11,000 Gal., 15,000 Gal., and 20,000 Gal. Cap.
2—74,000 Bbl. and 3—10,000 Bbl. Cap.

SEPARATORS and COLLECTORS
3—8 ft., 10 ft. and 14 ft. Gayros

JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 10x16, 18x11, 20x8, 20x6, 20x16, 20x12, 26x12, 30x15, 30x13, 36x15, 36x30, 36x18, 36x14, 36x9, 36x6, 36x10, 36x24, 42x9, 48x24, 48x36, 60x42, 84x66, 36x16, 9x36

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5 No. 19, 25, 37 and 49 Kennedy
18 in., 24 in. 30 in. 36 in. and 48 in. Symons Disc
4—10 TZ Traylor 4 Ft. Gyratory
4—Nos. 5, 3 and 6 Austin Gyratory
2—Traylor T-12 Bulldog Gyratory, also 16 inch
8 in. Traylor T. Gyratory
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8, 9½ and 21
7—Symons Cone, 2, 3, 5½ and 7 ft.
6, 10 and 13 Inch Superior McCullys

ROTARY DRYERS and KILNS
4x20 "XA" and 6x35 "XB" Ruggles Coles
3x30 and 6x55 Christie
Single Shell 4x30, 5x35, 5x50, 5½x40, 6x20, 6x28, 6x35 and 7x28

STEEL DERRICKS
GUY: 8 Ton 85 ft. Boom, 15 Ton 100 ft. Boom, 20 Ton 115 ft. Boom, 50 Ton 100 Ft. Boom
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GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 and 30 Ton
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VIBRATING: 3x6, 4x8, 12x8, 5x8, 3x5, 4x5, 4x8, 4x10, 48x72 and 4x12, 1, 2 and 3 Deck
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Two ME650 Murphy Diesel power units. One used 6 months and one used 90 days. Both rebuilt and complete with clutch, sheave, etc.

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1—50 ton Ind. B. H. Loco. Crane, 8 wheel.
1½ yd. Marion 32 Electric Shovel.
⅜ yd. Marion Electric Shovel.
⅜ yd. Marion Gas Elec. Shovel.
Link Belt Bucket Loader, gas, crawlers.
Barber-Greene Bucket Loader, gas, crawlers.
8 Bucket Elevators, some enclosed.
Lot elevator chains, buckets, sprockets.
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No. 4-5-6-7½ and 9 Gyratory Crushers.
24x36" Farrell 15 B Jaw Crusher.
1—7" Newhouse B Crusher.
2—2' and 1—4' Symons Cone Crushers.
9"x36" Pioneer Jaw Crusher.
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30"x18" Blake Allis-Chal. Jaw Crusher.
Thomas S. D. Elec. Hoist 52" drum, 1.
Thomas S. D. Hoist, 14" dia. drum.
Robins Roll Screen, 3x8', 90% new.
41x78" Jeffrey Vibr; Screen.
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35' Portable Burch 22" belt loader.
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7½ ton Midwest Gas, Loco. 36" ga.
Raymond Pulverizer, Size 1 and 1.
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3 Dempster Dumpster Hoists, 12—2 yd. boxes.
Page D. L. Bucket, 4 RC 245.
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Fairleads for Koehring Shovel. New
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4 Crane Shovel Boilers.
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2—2 yd. V Steel Cars, 36" ga.

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TRACTORS & CRANES:
1—Caterpillar "D-4" Hi-Lift, Used.
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2—Insley Cranes, used, 1946.
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2—Universal "880" Jr. Portable Plants (1946).
1—Stationary screening plant w/bins.
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1 Bay City Shovel, with shovel and Backhoe attachments. Serial No. 2721—½ yd. New in 1941. Ex. cond. Price $7,600.00
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1—200KW 400 RPM 3/60 Buckeye Diesel Generator Set
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1—Lorain 40—¾ yd. shovel with Trench Hoe attachment.
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Both machines rebuilt and in good running order.
Priced for quick sale.

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1—10' Stephen Adamson Heavy Duty Pan Feeder with Speed Reducer and 5 HP Motor—New
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1—No. 40 Telsmith Reduction Crusher
1—14"x24" Allis Chalmers Roll Crusher
1—24"x5' Barber Greene Reciprocating Plate Feeder
1—30"x5' Kremser Reciprocating Plate Feeder
1—156'x24" Barber Greene Belt Conveyor
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1—75 HP G.E. Motor 3/60/440 RPM 860 Style B.U. 4017—Serial No. 160465
1—50 HP Crocker Wheeler 3/60/220 RPM 900 Type 5000 Serial No. 57381—Slip ring
1—25 HP Westinghouse 3/60/220 RPM 780 Style 235709A Serial No. 2379757—Slip ring
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(All above Motors are rebuilt and guaranteed)

2—5 HP Westinghouse 3/60/220/440 RPM 900 Frame 324 Type C. S. Style 1082155 Serial No. 47641 Ball Bearing—New

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Six cylinder Diesel Engine with Supercharger. Model D8C1879, bore stroke 6¾x8¾, Serial No. 30758, Gov. Speed 900 R.P.M. direct connected to Ideal Elect. Mfg. Alternator, type SA No. 140426 KW 150, KVA 187, Frame 450-31, 480 Volts, 3 phase, 60 cycle, 3 wire, 900 RPM, 225 Amp. F. 80. Field Amp. at rated P.F. 19, Field volt 125. Belted exciter, Ideal Electric Mfg. Co. D.C. Gen. No. 140427, Type D, Frame 225, 3 KW, 125 Volt, 3500 RPM, Amp. 24.

Six cylinder Diesel Engine with Supercharger, Model 6-DH8 1879, bore and stroke 6¾x8¾, Serial No. 20243, Gov. Speed 1000 RPM, twin disc clutch, belted to a Ft. Wayne Elect. Works Alternator No. 10188, type TRB, class 10-200-720, form 1, amp. 250, Speed 720, speed full load 720, belted We-t D.C. Generator, type SK-30-5, Serial No. 2283683, 125 Volt, shunt wound, 1800 RPM full load 5 KW.

FOR SALE SWITCHBOARD

Complete switchboard with individual metering for each alternator and exciter, field Rheostats, Burlington voltage regu. and synch lamps, Mfgd. by Wisconsin Elect. Mfg. Co.

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Six cyl. two cycle G.M.C. Diesel Engines connected as twins by herringbone gearing with single output shaft, separate clutches, rated at 350 H.P. for the twin two of two engines.

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As manufacturers of these machines we are in a position to assure you as to condition and operating ability. Send for catalog.

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5000 KVA West. Synchronous Condenser
CRUSHERS: 18x36 Eagle, 30x42 Diamond, 36x48 Traylor, 24x36 and 60x42 Farrell JAW, 25½ Kennedy, 36 Telsmith 14 and 16" also 30" Sym McCully GYR. 3 and 4' Symons Cone
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1½ yd. Link Belt K42 and K55 Draglines
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25 ton American Gasoline Loco. Crane
15 ton 36" ga. 20 ton std. ga. Diesel Locs.
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3—1250 HP Nordberg Diesel Gen. Sets 2300V

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1—Allis-Chalmers Rotary Kiln, 40 ft., 5 ft. diameter, good condition. Bargain.

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New York Trap Rock Corporation
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2—USED KIESLER BUCKETS ¾ cu. yd. (ONE NEEDS SOME REPAIR)
1—MOON GENERATOR—4 KW. D.C.

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Salary: 1 to 3 inches
$8 an inch
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Gurantee — to call on 27% more potential buyers than anyone else serving the industry.

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WANTED

Eight (8) inch heavy-duty dredge pump, belt-driven, right hand bottom discharge.

Address P.O. Box 44, Keokuk, Iowa

WANTED

Stiffleg Derrick with 110 ft. boom to handle 1½ cu. yd. clamshell bucket. (2) revolving screens, dia 4' or 5'x12' to 15'.

WENZEL MACHINERY RENTAL & SALES CO.
2136 Jefferson St. Kansas City, Mo.

WANTED

BOOM FOR 50-B BUCYRUS SHOVEL No. 4121. BOOM, STICK AND 2 YD. BUCKET FOR OSGOOD CONQUEROR MODEL—Serial No. 2562.

MONON CRUSHED STONE COMPANY
MONON INDIANA

WANTED

1—5½ ft. Symons standard head coarse bowl cone crusher.

The National Lime & Stone Company
Findlay, Ohio

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Quarry Superintendent and Production Manager seeks position where production is the problem. Now employed directing complete operations in one of the largest quarries in the U. S. Married, forty-eight years old, C. E. degree. Go anywhere—financial inducements are only factors which will sever present connection. What is your problem and what do you offer? Address Box H-21, Rock Products, 309 W. Jackson Blvd., Chicago 6, Illinois.

MANAGER. Twenty years experience in quarry operations and the production of crushed stone, sand and gravel. Full knowledge of materials business in all phases. Complete supervision production and sales. Any location. Write Box H-14, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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POSITION WANTED: Chemist of twenty-years experience in analyzing both wet and dry cement process desires position available in three months. Write Box H-6, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

Quarry manager, graduate C.E., long and varied experience in all fields of quarrying and crushed stone. Write Box H-16, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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WANTED

Rotary kilns: Size 11', 10', 9', 8', 7' and 6' dia. 100' or longer.
Compeb mills: 6' and 7' dia.
Tube mills: 5', 6' and 7' dia.
Jaw crusher: 7" x 9".
Ball mills: 7' in diameter or larger and 8' in length or longer.
Slurry filters, drum or disc type.
Steel tanks 14' in dia. x 12' to 25' or longer with ¼" or ⅜" plate.
Bradley Junior Pulverizer.

OLLIE E. LAWRENCE
BOX 688
QUINCY, MICHIGAN

WANTED

1 twin de-watering screw. Send complete data to TRMCO, Inc., 807 E. Main St., Morris, Ill.

WANTED TO BUY

Locomotives, 10 to 30 tons, gas or Diesel, Plymouth preferred, any condition or gauge. Quote, with full particulars. Midwest location. Must be cheap.

H. Y. SMITH CO.
828 N. Broadway, Milwaukee 2, Wis.

WANTED

One No. 8 Austin gyratory crusher, suspended type, to be used for parts replacement. Specify usable parts.

STEWART SAND & MATERIAL CO.
KANSAS CITY, MISSOURI

POSITIONS VACANT

Wanted—General Mill Foreman, Repair Foreman, Plant Chemists for cement plant operations. Give full particulars regarding age, family status, education, previous experience, salary expected. Write Box H-12, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

WANTED SUPERINTENDENT to assume full responsibility for operation of quarter million ton annual capacity limestone plant in midwest. Produces commercial crushed stone and agstone. Must be experienced and have thorough knowledge of equipment and all plant operations. Write Box H-17, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Illinois.

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ONE KEYSTONE SHAFT KILN READY FOR OPERATION WITH OIL FIRING SETUP TO USE No. 6 FUEL OIL. ALL MACHINERY, OIL PUMPS AND HEATERS HAVE AMPLE CAPACITY TO HANDLE TWO ADDITIONAL KILNS BY RUNNING MORE OPERATING SHIFTS. THIS PLANT COULD BE IN OPERATION WITHIN 60 DAYS. WAREHOUSE, OFFICE AND BOILER ROOM COMPLETE. HAVE ALL STRUCTURAL STEEL AND BUILDING MATERIALS TO COMPLETE MILL BUILDING. PLANT HAS OWN RAILROAD SPUR. HAVE UNLIMITED SUPPLY OF HIGHEST QUALITY RAW STONE. REASON FOR SELLING: INSUFFICIENT CAPITAL TO COMPLETE AND OPERATE PLANT. EXCELLENT LOCAL MARKET WITH NO COMPETITION. FOR COMPLETE DETAILS CONTACT BLACKBURN CONSTRUCTION COMPANY, BOX 26, IDAHO FALLS, IDAHO.

Sand and gravel plant 3 miles west of Bowie, Md. for sale, lease 230 acres. Also sand and gravel plant 3 miles east of Waldorf, Md., lease 60 acres. Lease 60 acres at Great Mills, Md., and 20 acres at Jarboesville, Md.

JOHN RITTER
4800 Branch Ave., S.E.
Washington 20, D. C.

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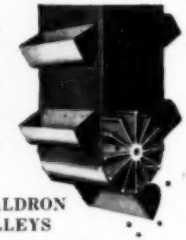

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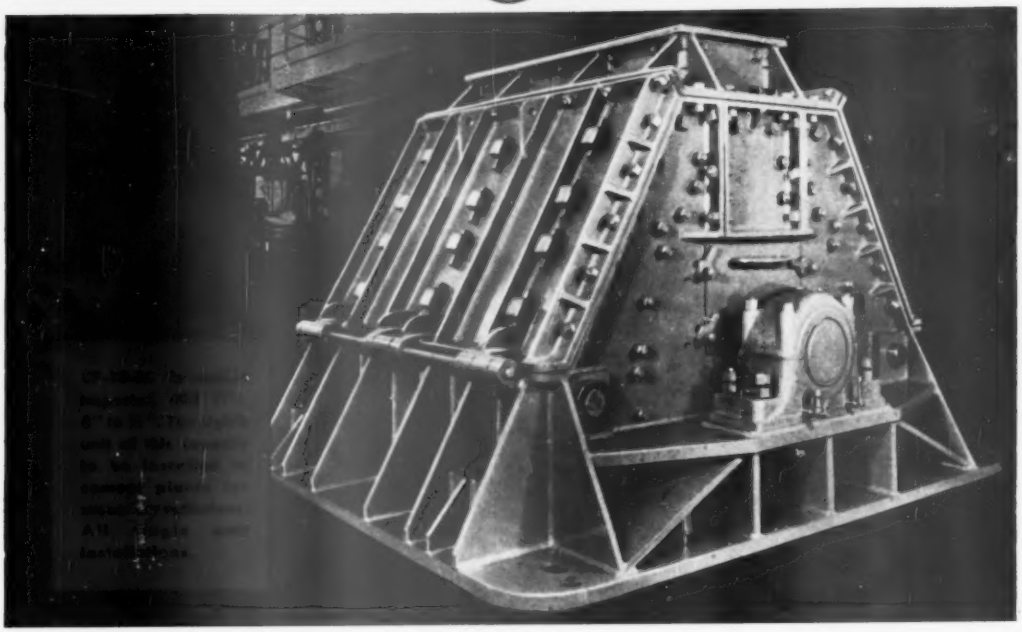

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